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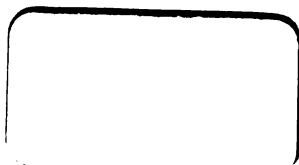
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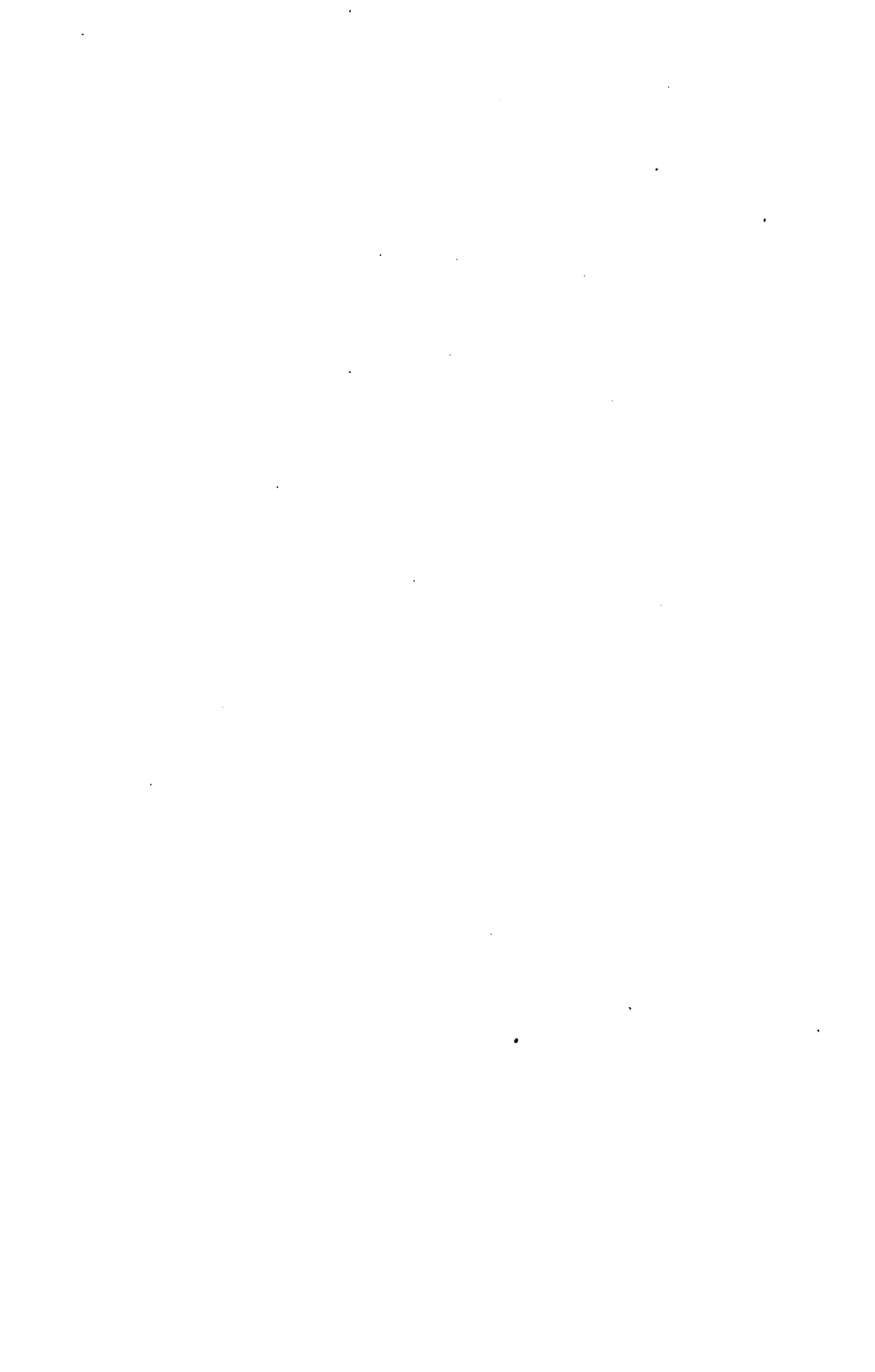
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**ANNUAL REPORT**  
**OF THE**  
**State Health Department**  
**OF**  
**WEST VIRGINIA**

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**JULY 1, 1920—JUNE 30, 1921**



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Annual Report of The  
DIVISION OF SANITARY ENGINEERING  
July 1920—July 1921

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Dr. W. T. Henshaw,  
State Health Commissioner,  
West Virginia State Department of Health,  
Charleston, West Virginia.

Sir:

It gives me pleasure to submit the following report of the activities of the Sanitary Engineering Division during the sixth year of its work.

GENERAL

There are at the present time three sanitary engineers employed in this division, the director and two assistant engineers. At the start of the fiscal year Mr. R. D. Bates was serving as assistant engineer with the division but in September, 1920, he accepted the position of chemist in charge at the Clarksburg Filtration Plant. His place was filled by Mr. R. C. Beckett, a graduate in sanitary engineering from Penn State College. The other assistant engineer, Mr. C. H. Young, who is also a graduate of Penn State College, was employed in June, 1921. It should be recognized that this force of three sanitary engineers is not sufficient to answer all calls for service made upon the engineering division of the State Health Department. However, larger appropriations will be necessary before further expansion of the work of supervision of the filtration plants, checking up and passing upon new water supplies, sewerage systems, sewage disposal plants and making of needed sanitary surveys of cities and town can be accomplished.

During this past year a considerable stimulus throughout the state has been evident with respect to communities waking up to the necessity of providing safe and satisfactory domestic water supplies. With the building of water purification plants to provide safe drinking water has come the necessity for carefully reviewing the plans of proposed filter plants. This is now being done in accordance with the new public health law, regarding all new water supplies and sewerage systems. This law provides that,

"No city, town or village, and no person, firm or corporation shall establish any system of drainage, sewerage, or water supply system until the same shall have been approved in writing by the State Health Commissioner, and any municipality, person, firm or corporation which shall violate the requirements of this section shall be deemed guilty of a misdemeanor and upon conviction thereof fined not less than one hundred dollars, nor more than five hundred dollars."



The law furnishes the State Health Department with a real lever for getting the right type of water purification system installed in a city or town to fit the existing conditions. It is fortunate that this law was on the statute books of the state during 1920 for had it not been there, one of the large cities in West Virginia would probably have selected a new water supply system which would not have solved the extremely unsatisfactory water supply conditions prevailing. The State Health Department advised against the proposed action. The new law was effective in stopping what is considered by this department both a waste of money and an unwise step. It seems probable that at an early date a modern filtration plant will be built, which once and for all will solve the water supply problem of the city in question.

With the rapid growth of the cities and towns in West Virginia has come the necessity for disposing of the body wastes in a safe and sanitary manner. Many communities have come to the Engineering Division bringing their problems and submitting the proposed designs for new sewerage systems, about to be built. The plans have been carefully checked over and changes called for where they were deemed necessary. In another section of this report will be found a detailed statement regarding new sewerage systems which have been constructed.

In order to arouse cities and towns to speedy action in providing new filtration plants and sewerage systems, a considerable amount of educational work has been carried on during the year by this division. It has fallen into two rather definite channels. First, every opportunity for bringing the subject of pure water supplies before the public by the means of talks and lectures has been eagerly taken. Engineers of the department have given talks before all types of gatherings, city councils, medical societies, teachers' institutes, public mass meetings, and civic organizations such as the Rotary Clubs where representative business men of the community come together.

The second mode of reaching the people and the layman in particular, has been through the daily press. In all least, four of the larger cities, after the co-operation of editors of the newspapers was obtained, a short, concise, interesting article on water supply conditions in that community was presented each week. Those articles bore chiefly on the health and financial cost to the average citizen of impure public drinking water supplies. The response shown by the public to these weekly contributions, which have been given good display in the newspapers, has been good. It is confidently expected that new filtration plants will soon be built in at least three of the cities where this mode of attack on impure water supplies is being waged by the State Health Department.

The campaign for better safeguarding the public swimming pools has been carried on throughout the year. Under the section of the annual report dealing with this subject, will be found the code of regulations adopted by the Public Health Council to carry into effect the provisions of the swimming pool law. Many new pools both indoor and outdoor, are being built in West Virginia and it is vitally important that definite supervision be given regarding the construction and operation of these swimming pools.

Possibly one of the most far reaching developments with respect to the work of this division has been the adoption of a plan for co-operating definitely with the Agricultural Extension Division in Rural Sanitation. The plan deals with the matter of getting the message of typhoid fever prevention, pure water supplies and sanitary disposal of body wastes to the rural people of West Virginia through the medium of the 4 H camps held in nearly every county of the state during the summer.

In June, 1921, a full time worker was engaged for three months whose work it was to see that these summer camps were properly sanitized, that certain features of the bearing of pure water supplies, sanitary privies on the health of the boys and girls in the country were forcefully brought out by actual demonstration in the camps. Mr. John Brewster, a graduate at West Virginia University, was employed in the Sanitary Engineering Division for the three months' period starting in June and his report, though it extends through July and August, has been included since it outlines so clearly the manner in which this question of rural sanitation was dealt with in this co-operative scheme of reaching the country people.

#### DISTRIBUTION—FIELD WORK—1920-1921

Alderson	Elkins	Oak Hill
Affinity	Elm Grove	Omar
Bertha Mines	Fairmont	Philippi
Bethany	Follansbee	Petersburg
Belington	Grafton	Parsons
Burnsville	Grantsville	Piedmont
Bower	Gassaway	Parkersburg
Braeholm	Glen Ferris	Pittsburgh, Pa.
Buckhannon	Hinton	Pt. Pleasant
Bluefield	Huntington	Piedmont
Beards's Fork	Holden	Quinnimont
Beckley	Hamlin	Ripley
Barboursville	Logan	Ronceverte
Boston, Mass.	Lewisburg	Rainelle
Bridgeport	Morgantown	Sistersville
Clarksburg	Martinsburg	Spencer
Charleston	Moorefield	Sturgiss City
Cass	Middlebourne	St. Albans
Charles Town	Monaville	Shinnston
Catlettsburg, Ky.	Millville	Shepherdstown
Cameron	Milton	Thomas
Clendenin	Marlinton	Thurmond
Capels	Marietta, Ohio	Vulcan Mines
Cedar Grove	Mt. Hope	Wheeling
Chester	Madison	White Sulphur
Davis	Montgomery	Wellsburg
Durbin	Monclo	Weston
Dunbar	Mason City	Weirton
Elkhorn	Nitro	West Union

**NEW WATER SUPPLIES AND FILTRATION PLANTS****Type of Plant**

**Elm Grove, Ohio County**—Rapid sand filter plant, capacity 2,000,000 gallons daily, entirely overhauled. New sand placed in filters. Chemical feed more systematic and more intelligently done. Testing laboratory installed for making daily tests to control filter plant operation.

**Grantsville, Calhoun County**—Report submitted by consulting engineer for new public water supply. Source of supply deep well. Approval given for construction of new system.

**Hamlin, Lincoln County**—New public water supply plans submitted to Engineering Division. Source of supply deep well. Approval given for carrying out proposed plans as outlined.

**Huntington, Cabell County**—Two additional filters 1,000,000 gallons capacity installed. By this step the overload on existing filters done away with. Approval given for this much needed improvement.

**Morgantown, Monongalia County**—Improvements carried out with respect to operation of rapid sand filter plant. Chemical feed practice and chlorination improved.

**Mt. Hope, Fayette County**—Due to growth of town and increased demand for water, an auxiliary supply of water has been developed from Sugar Creek Mine. Permission granted for use of this supply provided. Disinfection treatment to be adopted as safeguard on supply.

**Parkersburg, Wood County**—Eight units of the Smith filtration system partially rehabilitated by replacing old dirty sand by new sand. Work not entirely satisfactory. Straining action of sand over under-drains not sufficient to prevent dirt and bacteria passing into mains at times when Ohio River is muddy.

**Piedmont**—After study of consulting engineer, town voted to carry out certain essential improvements to obtain an adequate and satisfactory public water supply. New pumping equipment and chlorinator will greatly improve existing condition of insufficient quantity and unsatisfactory quality.

**Shinnston, Harrison County**—Complete modern rapid sand filtration plant constructed by town authorities. Bond issue \$75,000. Capacity plant 1,000,000 gallons. Concrete throughout. Lime and alum used in preliminary treatment. Chlorination provided. Weekly bacteriological tests carried on by chemist at Clarksburg filter plant. Results highly satisfactory.

**St. Albans, Kanawha County**—New rapid sand filtration plant constructed. Capacity 1,500,000 gallons. Provision for treatment with lime and alum. Plans passed upon and approved by Engineering Division. A small testing laboratory for carrying on chemical and bacteriological examinations will be an essential part of the new plant that intelligent supervision may be given.

**Spencer, Roane County**—Approval given for building of new pump station and emergency intake in Spring Creek one-half mile above present pump station. Creek water to be used only in case of emergency when it will be pumped to impounding reservoir, settled and then chlorinated before being pumped into the city mains.

**Weston, Lewis County**—Complete overhauling of 1,000,000 gallon rapid sand filtration plant. New sand placed in filters, strainers repaired, wash water pump put into service, duplicate chlorinators made available, small water testing laboratory completely equipped for carrying on daily chemical and bacteriological tests.

**Wellsburg, Brooke County**—New public water supply from deep wells being developed to take place of present water supply which is derived from both deep wells and Ohio River. Air lift pumping equipment being installed.

**Welch, McDowell County**—Water supply system improved. A well 402 feet deep, 12 feet diameter, has been developed. New reservoir and new pumping equipment installed and several hundred feet of new pipe laid.

**Weirton, Hancock County**—Gravity filtration plant installation partially completed by Scaife Filter Company. Capacity 500,000 gallons per 24 hours. Wooden tub filters. Lime and alum to be used before water passes to sedimentation basin. Chlorination of filtered water by standard apparatus.

## NEW SEWERAGE SYSTEMS—1920-1921

### Description of System

**Clarksburg, Harrison County**—Sanitary and storm sewers designed and constructed in connection with rather extensive street paving program. Greater portion of work in sanitary sewers consisted of replacing former lines which had become inadequate, having been laid when the city was first incorporated.

**Clendenin, Kanawha County**—Plans for combined sewer reviewed and approved by Engineering Division. Discharge is directly into Elk River with no treatment.

**Follansbee, Brooke County**—Sanitary sewerage system at housing development of La Belle Iron Works approved. Sewage discharged directly into the Ohio River without treatment.

**Hollidays Cove, Hancock County**—Sanitary sewerage system designed and plans approved after certain necessary changes in design had been made.

**Madison, Boone County**—New sanitary sewerage system has been designed and installed in this town of 700 people at a cost of \$35,000. Funds provided by bond issue. Sewage is discharged without treatment into Little Coal River.

**Millville, Jefferson County**—Complete sewerage system and disposal plant for housing development Pittsburgh Limestone Company quarry. Treatment carried on by means of septic tanks and sand filters.

**Milton, Cabell County**—Complete sanitary sewerage system for town designed. Plans were approved by State Health Department after necessary change in location of outfall sewer had been made. Requirement was that sewage be discharged into Mud River well below the intake for public water supply of the town.

**Midelburg City, Logan County**—Sanitary sewerage system constructed. Sewage treatment plant required on account of neighboring public water

supply. In granting approval, alternative given of complete treatment or running sewer outfall, well below water works intake. Latter scheme favored.

**Mohler Addition, Charleston, Kanawha County**—Sanitary sewerage system designed and approved by State Health Department. Sewage discharged into Kanawha River without treatment.

**Parsons, Tucker County**—Approval given for making extensions to existing sanitary sewerage system. Certain changes in design were required before permit was granted.

**Spencer, Roane County**—Preliminary profiles and designs for sewerage system were made by sanitary engineers of State Health Department, it being necessary to determine the State's proportional payment toward the construction of the system to serve both the city of Spencer and the State Insane Hospital. Treatment of the sewage will be required by sedimentation basin or Imhoff tank since it is deemed by the Health Department unwise to discharge raw sewage into Spring Creek. Money for building system has been provided by bond issue in Spencer and by action of State Legislature.

**Sturgiss City, Monongalia County**—Complete plans filed with State Department of Health for new sanitary sewerage system in Sturgiss City. After the changes in design required by Engineering Division had been made, approval was given for the construction of the system.

## **WATER BORNE TYPHOID FEVER AND EMERGENCY CHLORINATOR SERVICE TO CONTROL OUTBREAKS**

The three brief summaries of typhoid outbreaks in small towns in West Virginia which are given below, show that considerable work still remains to be done before public water supplies in the towns and cities of this state can be considered safe. The emergency chlorinators owned by the State Health Department have given particularly good service during the period embraced in this annual report. The equipment is always maintained in first class condition by the Engineering Division so that water borne typhoid outbreaks may be speedily brought under control. The sanitary engineers are ready to give instant service to communities in need of assistance.

### **ALDERSON, MONROE COUNTY—CHLORINE TREATMENT STARTED**

During March and April, 1921, considerable typhoid fever was reported from Alderson. Knowing the unsatisfactory character of the public water supply which is obtained from the Greenbrier River without purification of any sort, an engineer was promptly sent to Alderson to install the emergency chlorinator owned by the State. Immediately after the disinfection treatment was started a special report was made both in person and in writing to the Chamber of Commerce of that town. In the report it was explained that the typhoid fever could be expected unless precautions were taken to disinfect the supply. The recommendation was made that the town purchase a chlorinator of their own at once. Due to commendable action of the Chamber of Commerce cooperating with the town officials, a machine was immediately obtained and during the first part of May a permanent installation of a chlorinating plant to disinfect the public water supply, was completed.

### **SPENCER, ROANE COUNTY**

The water supply being furnished at the town of Spencer was found to be grossly polluted upon investigation by this department. The State Health Commissioner immediately ordered a chlorinator installed that the water supplied to the town might be made safe. This order was complied with promptly. Under ordinary conditions the water supply comes from a storage reservoir in the hills back of the town. However, during the latter part of 1920, due to the drought, the water impounded in the reservoir back of the large dam became exhausted and the grossly polluted Spring Creek water was pumped into the water mains. Investigation showed that the children in the public schools of Spencer used this supply for drinking water. The typhoid fever outbreak amounting to thirty or forty cases and resulting in at least two deaths from which Spencer suffered during the last three months of 1920, undoubtedly was attributable in large part to the contaminated public water supply. With the chlorination treatment which is now being faithfully carried on, weekly reports being filed with the State Department of Health, and with

a proper sewerage system installed which is now possible, for necessary funds have been provided to build the system, Spencer should be able to shake off the incubus of typhoid fever which has so long held her back.

### PHILIPPI, BARBOUR COUNTY

Thursday morning, January 8th, 1921, a rumor reached the State Department of Health from a visitor to Charleston that there were about twenty-four cases of typhoid fever in Philippi. At this time no cases had been reported to the State Health Department through official channels. Immediately the health officer of Philippi was reached by telegraph in order to confirm this report and to ascertain the number of cases.

An engineer of the department left Charleston at 11 A. M. for Philippi with an emergency chlorinator to prevent further outbreaks if the former cases should prove to be water borne. That this assumption was correct was evidenced by the fact that one month previous to this time the city of Elkins, situated above Philippi on the same river, had experienced a slight outbreak of typhoid and since Philippi used this river water untreated, the supposition was further confirmed.

The State Health Commissioner that morning immediately telegraphed instructions to the cities of Grafton and Fairmont situated on and using the same river water, to increase chlorine dosage at the two plants and at the same time to boil water for an indefinite period. The health authorities of Pennsylvania were likewise informed of the inherent danger as this river makes its way across West Virginia into Pennsylvania. The director of the Bureau of Vital Statistics who was in Parkersburg was advised to proceed from Parkersburg to Philippi to make any necessary epidemiological survey and cooperate with the sanitary engineer in controlling the epidemic.

Sunday morning the president of the water company and both pumping engineers were aroused early and every one proceeded to the plant where instant installation of the emergency chlorinator was begun. At 1:30 P. M. the chlorinator and water pump were started and continued until 5 P. M. All consumers reachable by telephone were notified to open all spigots for one hour from 4 until 5 P. M.

Monday the plant was again started dosing at the rate of about 0.6 p.p.m. of chlorine as on the previous day. All dead ends as well as fire plugs were opened in order to thoroughly clean out the water lines. Bacteriological sampling of the supply at various points was started and favorable results were obtained and reports returned to Philippi the following Wednesday.

### CHLORINE DOSAGE CONTROL

An attempt has been made during the past year to bring about greater satisfaction with chlorination methods, particularly in those towns in West Virginia which has to depend upon disinfection treatment alone to safeguard their public water supply. To put the chlorine treatment on a more systematic basis the Engineering Division has designed and had constructed orthotoluidin testing kits at a cost of \$7.50 each. These small outfits containing standards and testing solution have been supplied

to the various water companies and towns at cost. Furthermore, one of the engineers has visited each community adopting this method of chlorine treatment control and instructed the engineer just how to make the test to ascertain whether enough chlorine has been added to sterilize the water. In general the excess chlorine present in the water at the pump station is regulated to range between 0.1 and 0.2 p.p.m., while in the city mains the excess chlorine is held at about .05 part per million. The engineers and operators of chlorinating apparatus have taken considerable interest in this scheme of regulating chlorine dosage and given good cooperation. The testing outfits are already in use in the towns listed below:

### TOWNS NOW CONTROLLING CHLORINE TREATMENT BY ORTHOTOLUDIN TESTS

Barboursville	Elkins	Norton
Bluefield	Fairmont	Parsons
Bower	Gassaway	Petersburg
Black Betsey	Grafton	Pratt
Clendenin	Glen Ferris	Philippi
Cass	Kingwood	Parkersburg
Charles Town	Logan	Rowlesburg
Charleston	Monongah	Shepherdstown
Dunbar	Morgantown	Weston
Elm Grove	Martinsburg	Wheeling

### CHLORINATING PLANTS — ACTIVITIES — SPECIAL REFERENCE TO PAST YEAR

Town and Company	Action Taken
Affinity: Mining Company	Installation at mining camp to protect water supply.
Alderson: Alderson Municipal Water Co.	Typhoid outbreak. Emergency apparatus belonging to State Health Department installed. Through co-operative action Chamber of Commerce and town authorities, new chlorinator purchased by town.
Bower: W. Va. Coal & Coke Company	Pump station and chlorinator destroyed by fire. Immediate action taken to install new chlorinator.
Buckhannon: Buckhannon Light & Water Co.	Duplicate apparatus obtained in connection with rehabilitation of entire water works.
Capels: Central Pocahontas Coal Co.	New apparatus installed in connection with aerator and gravity filtration plant. Chlorine applied to clear water well.



Charleston:	Change method of application of chlorine.
W. Va. Water & Electric Co.	Now fed directly into suction line to pumps instead of into clear well. Considerable saving in chlorine and more effective operation.
Charleston:	Swimming pool built by park authorities.
Luna Park	Recirculation and chlorination required and chlorinating apparatus installed under supervision of Sanitary Engineering Division.
Charles Town:	New chlorinator installed to replace old fashioned method of hypochlorite treatment.
Charles Town Water Co.	
Logan:	Hypochlorite treatment superceded by liquid chlorine. More reliable and effective operation obtained since change has been made.
Logan Water Works Co.	
Martinsburg:	Liquid chlorine apparatus installed to replace hypochlorite outfit. Satisfactory results obtained.
Martinsburg Municipal Water Plant	
Martinsburg:	Chlorinator installed at new outdoor swimming pool built at amusement park just outside the city. Supervision of installation by Sanitary Engineering Division.
Rosemont Park Company	
Middlebourne:	Emergency chlorinator installed to disinfect contaminated river water. Well water supply had become exhausted.
Middlebourne Water Co.	
Morgantown:	Duplicate parts for chlorinator obtained on recommendation this department.
W. Va. Utilities Co.	
Parkersburg:	Duplicate chlorinator unit installed.
Parkersburg City Water Works	
Philippi:	Outbreak of typhoid necessitated installation of emergency chlorinator belonging to Division of Sanitary Engineering. New apparatus immediately purchased by water company and put in service by sanitary engineer from State Health Department.
Tygarts Valley Water Co.	
Shinnston:	New chlorinating plant installed as part of new complete water purification system. Gravity filters and chlorinator afford safe drinking water supply where formerly supply unfit for use.
Shinnston Water Company	
Vulcan Mines:	Mining camp water supply protected by installation of new chlorinator.
Mining Company	

Spencer:	Typhoid fever outbreak occasioned by
Spencer Water & Ice Co.	use of highly polluted creek water
	used during dry summer to supplement regular public supply. Chlorinator ordered into service by State Health Commissioner.
West Union:	Pending development new public water
West Union Water Works	supply from deep wells. Hypochlorite plant installed to treat highly polluted river water pumped into city mains.

### COMPLETE LIST OF INSTALLATIONS IN WEST VIRGINIA

#### Liquid Chlorine Apparatus Treating Public Water Supplies

Affinity	Elm Grove	Philippi
Alderson	Fairmont	Piedmont
Barboursville	Gassaway	Pratt
Belington	Glen Ferris (2)	Richwood
Bluefield (3)	Grafton	Ronceverte
Black Betsey	Hinton	Rowlesburg
Bower	Huntington (2)	Shepherdstown
Bramwell	Kingwood	Sistersville (2)
Buckhannon	Lewisburg	St. Albans (2)
Capels	Logan	Spencer
Cass	Martinsburg	Thomas
Catlettsburg	Monongah	Weston (2)
Charleston	Morgantown	Weirton
Charles Town	Nitro (2)	Wheeling (2)
Clendenin	Norton	White Sulphur Springs. (Sewage)
Davis	Parsons	Welch
Dunbar	Parkersburg (2)	Williamstown
Elkins	Petersburg	Vulcan Mines

### EDUCATIONAL WORK

The first feature of the educational work to be mentioned deals with the giving of talks and lectures in various parts of the state. Following urgent requests from private individuals, city councils, civic bodies, school officials and medical societies and many other sources, the following talks and addresses have been given from time to time throughout the year by different engineers in the division.

Locality	Audience	Subject	Type of Lecture
Bluefield.....	Chamber of Commerce and City Council	Tastes and odors in Bluefield public water supply	Discussion of imperative need of providing a more adequate public water supply. Cause of tastes and odors explained
Boston, Mass.....	State Sanitary Engineers Association.....	Inter-state water supplies and their control by state and federal authorities	Paper presented before the chief engineers from 35 State Health Departments assembled at the Annual Convention of State and Territorial Health Officers in Boston

Cameron.....	Red Path audience	Chautauqua	Necessity for sewerage system bond issue	Plea made to provide funds by bond issue to construct adequate sewerage system
Charleston.....	Boy Scout Leaders		Camp Sanitation	Safe water supplies and typhoid fever prevention discussed
Charleston.....	State Board of Public Works		Spencer Typhoid and sewerage	Explanation given of serious situation in Spencer calling for emergency legislation on part of the state
Charleston.....	W. Va. Eng. Assoc.		Water purification in West Virginia	Stereopticon lecture to engineers on results of water filtration and chlorination in West Virginia
Charleston.....	Health Officers' Convention, quarterly meeting		How Sanitary Engineers' Division endeavors to protect public water supplies in West Virginia	Stereopticon lecture to health officers and public health nurses from all parts of West Virginia.
Charleston.....	Civics class Junior High School		Charleston's public water supply	Stereopticon lecture. Methods by which polluted Elk River water is made safe for drinking purposes explained
Clarksburg.....	County Medical Society		Need for full time County Health Officer	Results of sanitary survey of city set forth
Clarksburg.....	Directors Chamber of Commerce.....		Sanitary improvements necessary in Clarksburg	Main points of sanitary survey, water supply, milk supervision, garbage disposal and sewerage system commented on
Clarksburg.....	Public meeting of citizens		Clarksburg's sanitary needs	Outline of results of sanitary survey set forth
Grantsville.....	City Council		New public water supply	Result of reconnaissance of possibilities for new water supply with cost data described
Mason City.....	Mass Meeting of citizens		Public water supply system — typhoid fever control	Stereopticon lecture showing how a public water supply makes for better health conditions in congested community
Montgomery.....	Chamber of Commerce		Garbage Incinerator	Location and cost of garbage incinerator discussed following field investigations
Montgomery.....	Chamber of Commerce		Milk Supply	Discussion of milk situation in city with recommendations for supervision
Oak Hill.....	City Council		New public water supply	Outline of cost of installing water supply for Oak Hill
Parkersburg.....	City Council		Supervision of city water supply	Daily testing of city water was requested in a talk outlining the importance of this supervision of public water supply
Pt Pleasant.....	Business Men's Club		Water supply and sewerage needs in Point Pleasant	Stereopticon lecture to outline necessary civic improvement in Point Pleasant
Wheeling.....	Pure Water Commission and City Council		Filtration plant for Wheeling	Comparison made between proposed well system in Ohio River and a modern rapid sand filtration plant. Reasons given for favoring filtration plant

The second feature of the educational work carried on by this division to stimulate communities to gain the benefits derived from safe drinking water supplies, is illustrated by the following inserts which are representative of the type of articles being published weekly in certain cities in the state, among which may be mentioned Wheeling, Fairmont

and Logan. This work is being done that the layman may be prepared for bond issues on filtration plants when they are presented for his consideration.

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### A DOLLARS AND CENTS VIEWPOINT OF THE WHEELING WATER SUPPLY

What has been one of the many unfortunate features of the failure of the City of Wheeling to provide a safe, public water supply. The investigation carried on by the State Health Department a year or so ago revealed this point clearly. The people have been forced to put little filtration systems into their own houses and operate them for themselves instead of having one large filtration system owned and operated by the City of Wheeling.

These house filters are expensive and not every one can afford to purchase them and have them installed. They cost from \$300.00 to \$500.00, depending upon the design and size. It is estimated that there are more house filters in the homes of Wheeling than in any other city of its size in the eastern part of the United States. One hundred thousand dollars was the conservative estimate made of the cost of the house filters in Wheeling, by the State Health Department after a careful study of the question. These filters are constantly deteriorating. They must be repaired. Chemicals are required in their operation just as certain chemicals are essential in the running of a large water purification system. Repairing house filters, buying chemicals and purchasing new parts for these filters all cost money. And the regrettable part of it all is that this action is not putting the money into proper channels to bring safe, clear, drinking water to all the people of the city, rich and poor alike.

The people of Wheeling who could afford these filters have bought them—why?

1. To safeguard their own health for they had a great fear of the contaminated river, unfiltered water and did not want to have their families sick with typhoid and dysentery.

2. To get rid of the dirt in the water, for usually the general unattractiveness of a water even more than the dangerous bacteria contained in it, makes people put in a filter to take out the sediment and dirt.

It is certain that much more than \$100,000 have already been spent in Wheeling in private homes for small filter plants. Must people be forced to continue this uneconomic expenditure of money? How much more reasonable it is for all to work together and to contribute only a small part of the cost of purchasing house filters to the building of one large, modern, water purification system which will furnish safe drinking water to every person in Wheeling, young and old. Especially is this a duty which all people owe to the children and babies in the city. They must have pure drinking water and lots of it during these hot, sticky, summer days.

## THE SWORD OF DAMOCLES OVERHANGING FAIRMONT

In the days when kings upon thrones were more common than in present times, the episode of the famous sword of Damocles took place. This story, which has come down through history, has thrilled all school children as they gasped with fear at the imminent danger, of the slender hair holding the sword suspended over the king's head giving way, thus allowing the keen sword to fall, bringing death to Damocles sitting at the banquet directly beneath the sharp sword. How clear a comparison can be made between this king and his great danger, and the City of Fairmont with the constant menace that hangs over it.

**WHAT IS THIS MENACE?**—Twenty-two miles above Fairmont on the Monongahela River lies Grafton, a city of 9,000 people. Nearly every year an epidemic of typhoid fever occurs here and the 2,500,000 gallons of sewage which is poured daily into the river, contains at all times countless millions of typhoid germs. There are now so many people in Grafton who have had typhoid fever in the past years that it is inevitable that typhoid fever germs are ever present in the sewage wastes from the city.

Perhaps the people of Fairmont may think that the swift turbulent flow of water over the rocky bed of the river as it flows down to the Fairmont water supply intake a mile or more above Fairmont, purifies the water. This is not the truth. On the contrary, the swift current of the stream does not give time for the typhoid germs to die out. As a result they are present in countless numbers when the water reaches the Fairmont pump station.

However, due to the constant vigilance of Mr. Clyde Morris, the water commissioner of the city, and Mr. Miller, the engineer at the pump station, the chlorinating apparatus which was installed in 1918 by the State Health Department is kept constantly in operation. It introduces daily thirty or thirty-five pounds of disinfectant into the water and the chlorine gas, during times when the river water is clear, effectively kills the typhoid germs introduced at Grafton and other towns above Fairmont which pour sewage into the river.

However, here is the link of the chain which is weak in the process of protecting the Fairmont water. When the river water becomes muddy the typhoid germs frequently are protected from the killing action of the chlorine gas by being inside the dirt particles. The typhoid bacteria are very small and it takes many thousands of them to make a visible speck as large as a minute dirt particle. When these dirt particles break up in the water mains the typhoid bacilli are freed. Then they can be taken into the bodies of their victims through eating raw vegetables washed in the city water, by drinking the water, or by other means through which water enters the mouths of persons.

How can a city hope to grow normally with this dread of fever constantly hanging over her? It is far more dangerous and deadly in its possible consequence than that famous sword of Damocles. The sword endangered but one life. This danger threatens the life of 20,000 people, particularly the younger boys and girls who have not gained an immunity against typhoid. It is indeed fortunate for Fairmont that the

Chamber of Commerce has slated this question of filtration for discussion at their session this fall. They should not lay it down until action has been taken to remove this menace from the lives of Fairmont's citizens.

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The third feature of the educational work has to do with the rural sections of West Virginia and is quite different from that touching on the cities problems.

Mr. John Brewster, a graduate of West Virginia University, was engaged in June, 1921, to give full time for a three months' period to the question of camp sanitation. This type of work may in the long run be the most effective of any done by the division, for it reaches out and touches the rural people at an impressionable point, namely, through their boys and girls. A new vision of public health work and preventive medicine thus may be brought to them.

A brief summary by Mr. Brewster of his activity in the summer camps and the points of sanitation which he emphasized is given in his report to me at the close of the three months' period. It is given below:

"During the past summer (1921), acting in the capacity of 'Camp Health Director,' I endeavored to teach the children from the rural districts of the state represented in the State Agricultural Camps, the FUNDAMENTAL principles of sanitation and hygiene. These, as Mr. Tisdale and I saw it, were: 1. The disposal of body wastes, 2. The procuring of a safe drinking water supply, 3. The disposal of garbage and other fly breeding material, 4. Care of the teeth, 5. Washing of the hands before meals, 6. The necessity for and advantages of a routine physical examination by a doctor with particular reference to the tonsils, adenoids, lymphatic and thyroid glands and lungs and heart.

Under the head of the disposal of body wastes, the children were taught the dangers from an insanitary privy with particular reference to typhoid fever and how to build the various kinds of sanitary privies. In as many camps as possible the boys themselves built sanitary privies or camp latrine boxes which incorporated the fundamental principles so that they learned by doing and by actual observation.

As to the subject of drinking water, the children were taught the dangers from an unprotected drinking water supply with here again special reference to typhoid fever and the water borne diseases. They were taught where to locate wells and springs, how to curb and protect them and the value of the pump as a means of getting the water out. They were shown the danger from open springs and the use of bucket and chain systems in wells. Finally they were taught the various methods of purifying water.

In the case of the disposal of garbage and manure and the like, they were taught that these were the breeding grounds for flies and the dangers attendant to having flies about the farm. They were shown how to build home incinerators and pits and were taught the necessity for getting rid of the flies.

The other points enumerated above, fall under the head of personal hygiene. As to these they were given tooth brush drills and lectures upon the care of the eyes and the body in general. Here especial stress was laid upon constipation, its causes, results and the simple measures for preventing it. Ordinary soap and hot water were preached as the best home antiseptics and disinfectants.

A physical examination of all the children in camp, thorough as the circumstances permitted, was given in each camp. In this examination the standard school health cards were used and followed. Within its scope the eyes, ears, nose, throat (tonsils), lymphatic and thyroid glands, heart, lungs and feet were covered. Standard health report cards were filled out for each child and sent in to Mrs. Jean T. Dillon at the State Health Department headquarters. Extreme difficulty was encountered in many instances, especially in regard to scales for weighing the children but these were met as well as could be done under the circumstances.

During the week and at odd hours little stunts were worked up with some of the children to be given in the pageant on Friday. These little stunts illustrated some cardinal point in sanitation or hygiene.

Aside from the instruction work I acted in the capacity of camp doctor and first aid man. In every camp there was some one continually receiving cuts, bruises, sprains or fractures and in some camps I was kept busy from morning until night fixing them up. In several instances there was real need for my services, e. g., during the summer in the camps where I was located there was received one compound fracture of both bones of the lower third of the left arm, one dislocated shoulder joint, three sprained ankles, (one suspiciously a fracture) and one case of spasmodic contractions of the bronchi with dipppnoea, besides several cases of la grippe.

In the physical examinations many cases of enlarged and diseased tonsils were discovered, decayed teeth by the thousands and several cases of adenoids and enlarged cervical lymphatic and thyroid glands were found.

During the summer I reached approximately six hundred children, about half boys and half girls in this number. Somehow I feel that I must have accomplished some good for they expressed great interest in the work and many expressed resolutions to better the conditions at home upon their return."

## RAILROAD WATER SUPPLIES

During this year a change was made with regard to the practice of certification of drinking water supplies used on railroads and vessels in the State of West Virginia. The former plan of issuing a certificate every six months which showed the source of water supply, gave a description of the purification process and listed in detail a summary of bacteriological examinations made during the previous six months, has been discontinued. The form shown herewith illustrates the present practice. On this form a statement is made that the railroad water supply is either satisfactory or is not satisfactory in the opinion of the State Health Department.

The detailed information with regard to the water supply is filed with the U. S. Public Health Service on a separate sheet and unless amended from time to time, the U. S. Public Health Service considers that conditions remain substantially as set forth on this information sheet.

The list of towns and cities in West Virginia where railroad water supplies are located, the ownership of the supply and condition of purity are set forth in the table given on page 19. Although considerable improvement has taken place with respect to the quality of these railroad water supplies in the past year, the twelve supplies listed as BAD show that time should be given to stimulating improvements in this direction so that all the railroad water supplies in West Virginia may be granted certificates stating that conditions are satisfactory and the water is safe. At six of the railroad supply points now listed as unsafe, filtration plants are either being built or are proposed so that a substantial betterment should soon be made.

The Standard Railway Sanitary Code, which establishes water supply as well as other standards, has been adopted for the State of West Virginia, the code being in the form as finally amended at the State Health Officers' Convention in Boston, Massachusetts, in June, 1921.

## WEST VIRGINIA

## Interstate Carrier Waters

City	Carrier	Ownership	1920-1	1921-2	1922-3	1923-4
Amigo.....	Virginian.....	M	B	.....	.....	.....
Berkeley Springs.....	B. & O.....	M	G	.....	.....	.....
Berryburg Junction.....	B. & O.....	M	B	.....	.....	.....
Berwind.....	N. & W.....	P	G	.....	.....	.....
Bluefield.....	N. & W.....	M	G	.....	.....	.....
Buckhannon.....	B. & O.....	M	B	.....	.....	.....
Charleston.....	B. & O.....	M	G	.....	.....	.....
Charleston.....	C. & O.....	M	G	.....	.....	.....
Charleston.....	K. & M.....	M	G	.....	.....	.....
Charleston.....	Kanawha & West Virginia.....	M	G	.....	.....	.....
Charleston.....	Toledo & Ohio Central.....	M	G	.....	.....	.....
Clarksburg.....	B. & O.....	M	G	.....	.....	.....
Clothier.....	C. & O.....	R	G	.....	.....	.....
Elkins.....	B. & O.....	M	B	.....	.....	.....
Elkins.....	Western Maryland.....	M	B	.....	.....	.....
Elmore.....	Virginian.....	R	G	.....	.....	.....



City	Carrier	Ownership	1920-1	1921-2	1922-3	1923-4
Eakdale.....	C. & O.....	R	G	.....	.....	.....
Evenwood.....	Glady & Alpena.....	M	G	.....	.....	.....
Fairmont.....	B. & O.....	M	B	.....	.....	.....
Fairmont.....	Monongahela.....	M	B	.....	.....	.....
Gary.....	N & W.....	P	G	.....	.....	.....
Gassaway.....	B. & O.....	M	G	.....	.....	.....
Gassaway.....	B. & O.....	R	G	.....	.....	.....
Gauley.....	C & O.....	R	G	.....	.....	.....
Gauley Bridge.....	Kanawha & Michigan.....	P	G	.....	.....	.....
Grafton.....	B. & O.....	M	B	.....	.....	.....
Green Springs.....	B. & O.....	R	G	.....	.....	.....
Hinton.....	C. & O.....	R	G	.....	.....	.....
Hinton.....	C. & O.....	P	B	.....	.....	.....
Huntington.....	B. & O.....	M	G	.....	.....	.....
Huntington.....	C. & O.....	M	G	.....	.....	.....
Kenova.....	N. & W.....	R	G	.....	.....	.....
Kenova.....	B. & O.....	P	G	.....	.....	.....
Kingwood.....	Morgantown & Kingwood.....	R	G	.....	.....	.....
Logan.....	C. & O.....	M	G	.....	.....	.....
Martinsburg.....	B. & O.....	M	G	.....	.....	.....
Mullens.....	Virginian.....	R	G	.....	.....	.....
Nallen.....	Sewell Valley.....	R	G	.....	.....	.....
North Fork.....	N. & W.....	P	G	.....	.....	.....
Oak Hill.....	Virginian.....	R	B	.....	.....	.....
Paint Creek Junction.....	C. & O.....	R	G	.....	.....	.....
Parkersburg.....	B. & O.....	M	G	.....	.....	.....
Peach Creek.....	C. & O.....	R	G	.....	.....	.....
Price Hill.....	C. & O.....	R	G	.....	.....	.....
Princeton.....	Virginian.....	M	G	.....	.....	.....
Quinnimont.....	C. & O.....	R	B	.....	.....	.....
Quinnimont.....	C. & O.....	P	G	.....	.....	.....
Rainelle.....	C. & O.....	M	B	.....	.....	.....
Rainelle.....	Sewell Valley.....	R	G	.....	.....	.....
Richwood.....	B. & O.....	P	G	.....	.....	.....
Ravenswood.....	B. & O.....	M	G	.....	.....	.....
Romney.....	B. & O.....	M	B	.....	.....	.....
Ronceverte.....	C. & O.....	M	G	.....	.....	.....
Sabraton.....	Morgantown & Kingwood.....	M	G	.....	.....	.....
St. Albans.....	C. & O.....	R	G	.....	.....	.....
Sutton.....	B. & O.....	P	G	.....	.....	.....
Sutton.....	B. & O.....	M	B	.....	.....	.....
Thurmond.....	C. & O.....	R	G	.....	.....	.....
Weston.....	B. & O.....	R	G	.....	.....	.....
Wheeling.....	B. & O.....	R	G	.....	.....	.....
Widen.....	Buffalo Creek & Gauley.....	P	G	.....	.....	.....
Williamson.....	N. & W.....	M	G	.....	.....	.....
Williamson.....	Williamson & Pond Creek.....	M	G	.....	.....	.....
Morgantown.....	Monongahela.....	M	G	.....	.....	.....
Rainelle.....	Sewell Valley.....	R	B	.....	.....	.....
Hendricks.....	M. & K.....	R	B	.....	.....	.....

NOTE: M—Municipal; P—Private; R—Railroad.

Certificate: G—Good; B—Bad; P—Provisional.

TYPE OF PERMIT FOR RAILROAD WATER SUPPLIES.

Treasury Department  
U. S. Public Health Service  
Form 8921-D

TREASURY DEPARTMENT  
Public Health Service  
WASHINGTON

Certificate of Examination of Water Provided for Common Carriers  
Engaged in Interstate Traffic

.....  
(Common carrier)

.....  
(Name of watering point, including State)

.....  
(Source and ownership of water supply)

.....  
The available records and data from observations made indicate that  
this water supply is.....of satisfactory sanitary quality and safety  
and therefore the present use of the water for drinking and culinary  
purposes in interstate traffic is.....permitted.

Indorsement by State Health Department:      Approved by:

.....  
(Name and title)

.....  
Surgeon General, U. S. P. H. S.

.....  
(Place)

.....  
(Date)

2-11207

# TYPE OF FIELD SURVEY REPORT FOR RAILROAD WATER SUPPLY.

**Treasury Department  
U. S. Public Health Service  
Form 8921-E**

**TREASURY DEPARTMENT**  
**Public Health Service**  
**WASHINGTON**

## Report of Water Supply Examined for Use in Interstate Traffic

Location..... Owner.....  
 (City.) (State.) (City, railroad, private.)  
 Surveyed on....., 192....., by.....  
 Previous Surveys:....., 192.....;....., 192.....;....., 192.....  
 Common carriers using supply.....  
 .....  
 .....  
 Other common carriers to whom supply is available.....  
 .....  
 Source and description of supply.....  
 .....  
 .....  
 Description of waterworks system.....  
 .....  
 .....  
 .....  
 Undesirable features of water supply system.....  
 .....-(Bypasses, cross connec-  
 .....tions, emergency intakes to unsafe water supplies, unsatisfactory operation,  
 .....lack of duplicate parts for chlorinating apparatus, etc.)  
 .....  
 .....  
 2-11513

Date when local officials were informed by State Health Department  
of undesirable features of water supply.....

Laboratory Data: The results of bacteriological and chemical ex-  
amination of samples of this water taken during the period.....,  
192...., to....., 192...., are:

Number of samples.....				Color.....	Number of samples.....	
Bac. per c. c.....° C.....					*Parts per million.	
B. Coli (confirmed) in—				Turbidity.....	Ox. consumed.....	
Cubic centi- meter	Total number portions	No portions positive	Per cent positive		M	
				Odor.....	MFree Am.....	
100				Chlorine*.....	M	
10				Total hardness*.....	MAlb. Am.....	
1				Alkalinity*.....	MNitrates.....	
0.1				Total iron*.....	Volative solids.....	
					Total solids.....	

Remarks: .....

This water supply is.....recommended for favorable certification.

(State Health Official.)

(Date.)

### SWIMMING POOLS

New swimming pools, out of doors and indoors, are being built in many sections of West Virginia. It is important that close supervision be given to the design of all new pools and to the operation of both new and old pools. During the past two months two new outdoor pools at amusement parks in Martinsburg and Charleston have been constructed. Recirculation and chlorination of the water was required. The Engineering Division gave considerable assistance to the pool managements in both cases. Recirculating pumps and chlorinators being installed under the supervision of the sanitary engineers. In the following table is given briefly the data already gathered by the Division with regard to swimming pools in this state.

Location and Ownership	Type	Source & Character Water Supply	Pool Treatment
Berkeley Springs: Hotel Management	Indoor	Mountain springs, safe	Continuous flow through pool
Clarksburg: High School	Indoor	City supply, filtered and chlorinated, safe	No treatment, fill and draw plan of operation
Clarksburg: County Club	Outdoor	West Fork River, sedimentation and chlorination	Water chlorinated as it enters pool
Charleston: Y. M. C. A.	Indoor	City supply, filtered and chlorinated	Re-circulation through pressure filters. Hypochlorite used at times
Charleston: Y. W. C. A.	Indoor	City Supply, filtered and chlorinated	Re-circulation system. Pressure filters. Apparatus to be installed in new building
Chester: Chester Water Co	Outdoor	City supply, crib in Ohio River, safe	Fill and draw plan of operation. Trouble from algae growths.
Fairmont: Y. M. C. A.	Indoor	City supply, safe most of the time, chlorination.	Pressure filters recirculation system and hypo treatment
Huntington: Camden Park	Outdoor	From deep wells, safe	Continuous flow through pool. Circulation unsatisfactory
Martinsburg: Rosemont Park Co.	Outdoor	Overflow from springs furnishing city water supply. Unsafe	Chlorination treatment and continuous flow through pool
Martinsburg: Y. M. C. A.	Indoor	City supply, safe. Spring water chlorinated	No treatment except hypo at intervals
Parkersburg: Y. M. C. A.	Indoor	City supply, filtered and chlorinated, safe	Fill and draw plan of operation, hypo treatment
Parkersburg: Country Club	Outdoor	Depp well supply, probably safe	Fill and draw plan of operation
Wheeling: State Fair Association	Outdoor	Two deep wells, safe	Re-circulation and chlorination, good supervision
Wheeling: Wheeling Park	Outdoor	City water supply, filtered and chlorinated	Continuous flow through pool
Wheeling: Y. M. C. A.	Indoor	City supply, chlorinated	Pressure filters and hypo treatment, chlorine apparatus now being installed
Wheeling: Y. W. C. A.	Indoor	City supply chlorinated but not filtered	Pressure filter, a.s., hypochlorite used at times
White Sulphur Springs..... White Sulphur Springs Hotel	Indoor	Avalon Springs, mountain supply, safe	Continuous flow through pool

In order to have some definite standards with which to work in carrying out the provisions of the State Swimming Pool Law, a set of regulations was drawn up by the Engineering Division. In determining upon the regulations the experience of other states in the country which have been handling swimming pool sanitation was in-

vestigated. Profiting by experience elsewhere and keeping in mind the conditions which at the present time prevail at swimming pools in this state, the following regulations were drawn up by the Sanitary Engineering Division and passed by the Public Health Council:

#### WEST VIRGINIA STATE DEPARTMENT OF HEALTH.

Regulations governing the construction and operation of public swimming pools—adopted by West Virginia Public Health Council, July, 1921.

Section 1. The water in the swimming pool shall have a sanitary quality acceptable to the State Department of Health. The bacterial content shall be maintained as low as is practically possible.

Section 2. The weekly bathing load of fill and draw pools shall not exceed *twenty*. To ascertain the weekly bathing load of a pool, divide the total weekly attendance by the pool capacity in thousands of gallons.

Section 3. Water in the pool shall be maintained of such clearness that the bottom of the pool can be distinctly seen where the depth of water is six feet or less.

Section 4. The pool walls shall be vertical and walls and floor shall be surfaced with white tile, or light colored cement or other impervious material. The surface shall be smooth and permit of easy cleansing. The swimming pool floor shall not slope more than one foot in twenty feet where depth of water is less than six feet. Depth of water opposite diving boards shall not be less than seven feet.

Section 5. The entire pool shall be surrounded by a curbing, preferably of concrete—not less than 12" wide and 2" high. This curbing prevents drainage from the floors or walks flushing back into the pool.

Section 6. Walks surrounding the pool shall be at least four feet wide and shall slope to properly located drains.

Section 7. Scum or overflow gutters of an approved type shall be provided on all pools. These gutters shall be arranged along the pool walls on all sides and shall be of such design that they can be easily cleaned. Properly spaced drains shall conduct the waste water to the sewer.

Section 8. Dressing rooms shall be properly ventilated, well lighted and clean. Concrete or tile floors shall slope to drains located at proper intervals.

Section 9. All persons shall take a shower bath, using soap before entering the pool. The pool must not be considered a bath tub.

Section 10. All pools shall be equipped with shower, one shower head to every forty dressing rooms or lockers. Showers shall be conveniently reached from the dressing rooms on the way to the pool.

Section 11. Toilets shall be provided, conveniently located to dressing rooms, one stool for each forty rooms. Urinals also shall be provided. If no running water is available sanitary privies must be constructed which conform to the requirements of the State Department of Health.

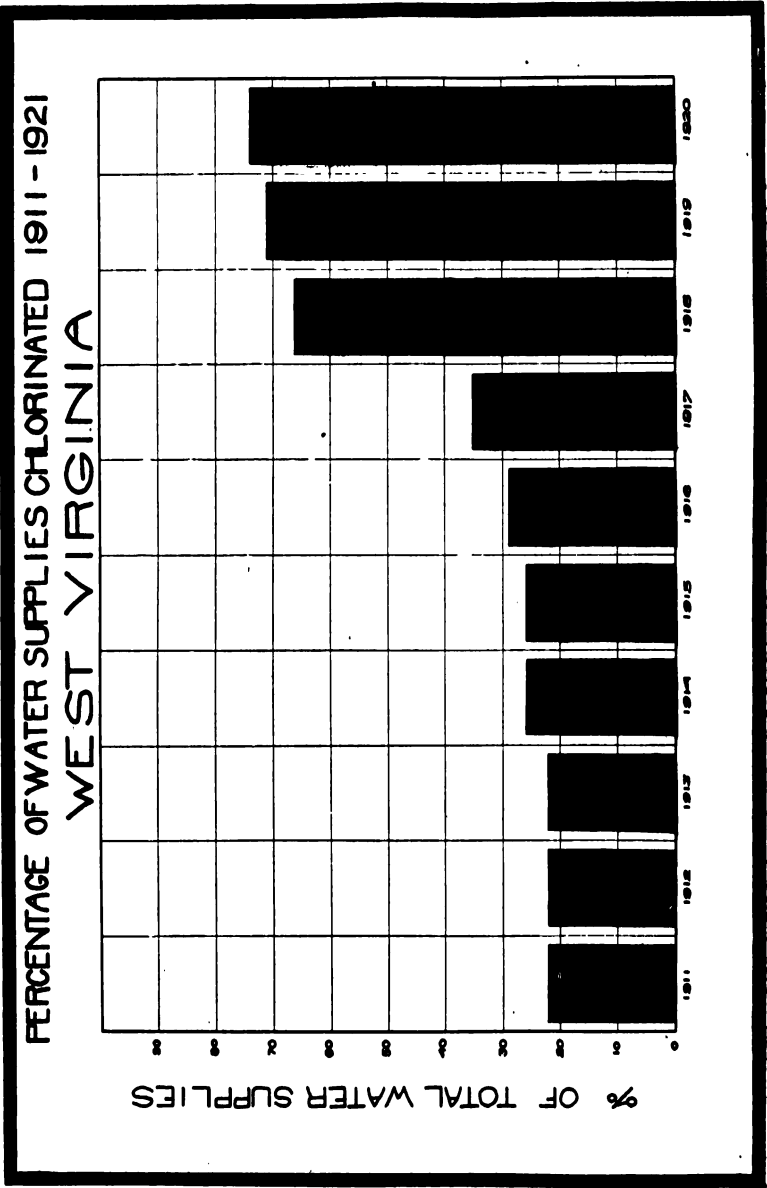
Section 12. All bathing suits and towels shall be thoroughly washed in warm water and soap after each use. They shall be completely dried before again being used. Chemical disinfectants, when used, must be used prior to rinsing.

Section 13. Every pool shall have in attendance during the hours that the pool is open to the public, a person whose duty it shall be to see that the regulations are complied with and who is a strong swimmer, able to do rescue work and who understands resuscitation.

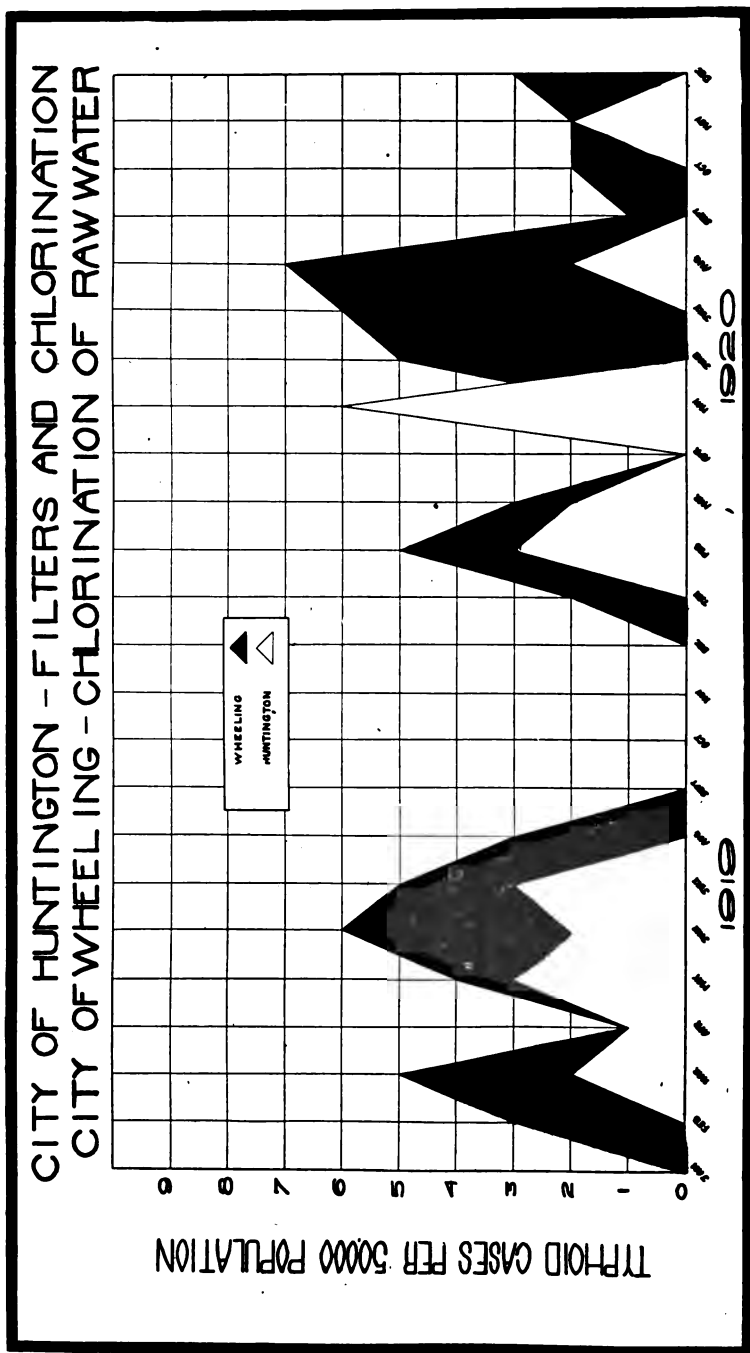
Section 14. The State Department of Health recommends and approves a type of poster which sets forth the State regulations and rules for proper conduct. Such posters giving regulations should be prominently displayed in the dressing rooms and about the pool. A specimen poster will be furnished by the Division of Sanitary Engineering of the State Department of Health.

Section 15. No person having an obvious communicable disease, skin eruptions, eye, ear, nose or throat infection shall be permitted the use of any public swimming pool.

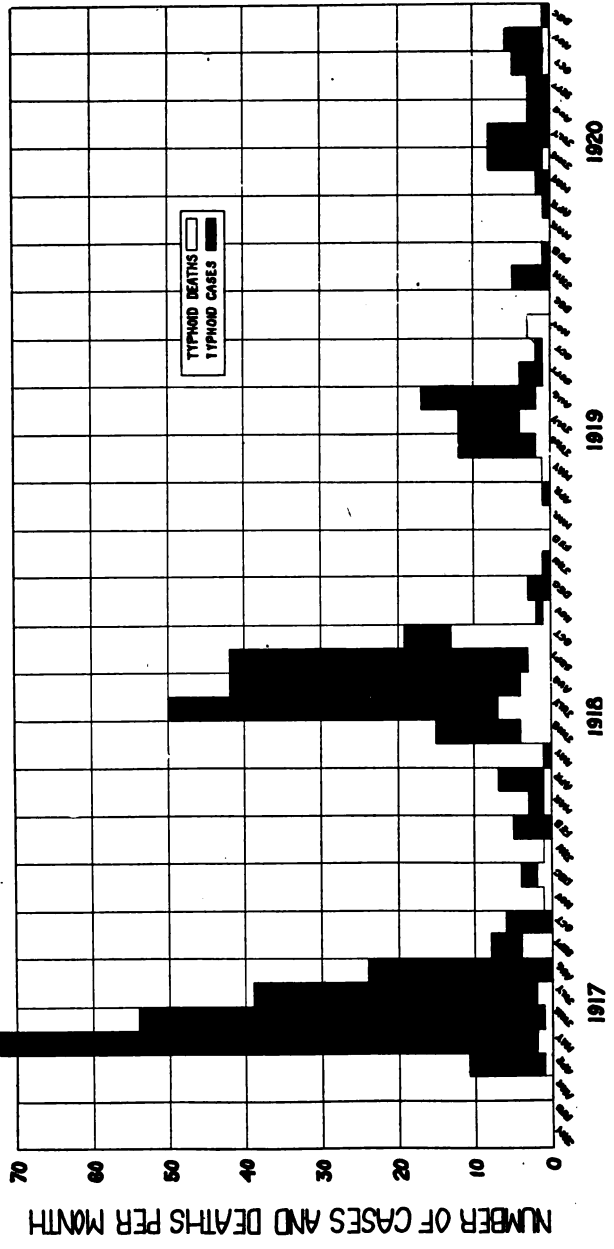
Section 16. Pool managements shall file monthly with the State Department of Health, on blanks provided by it, a record of attendance at the pool and of pool operation.

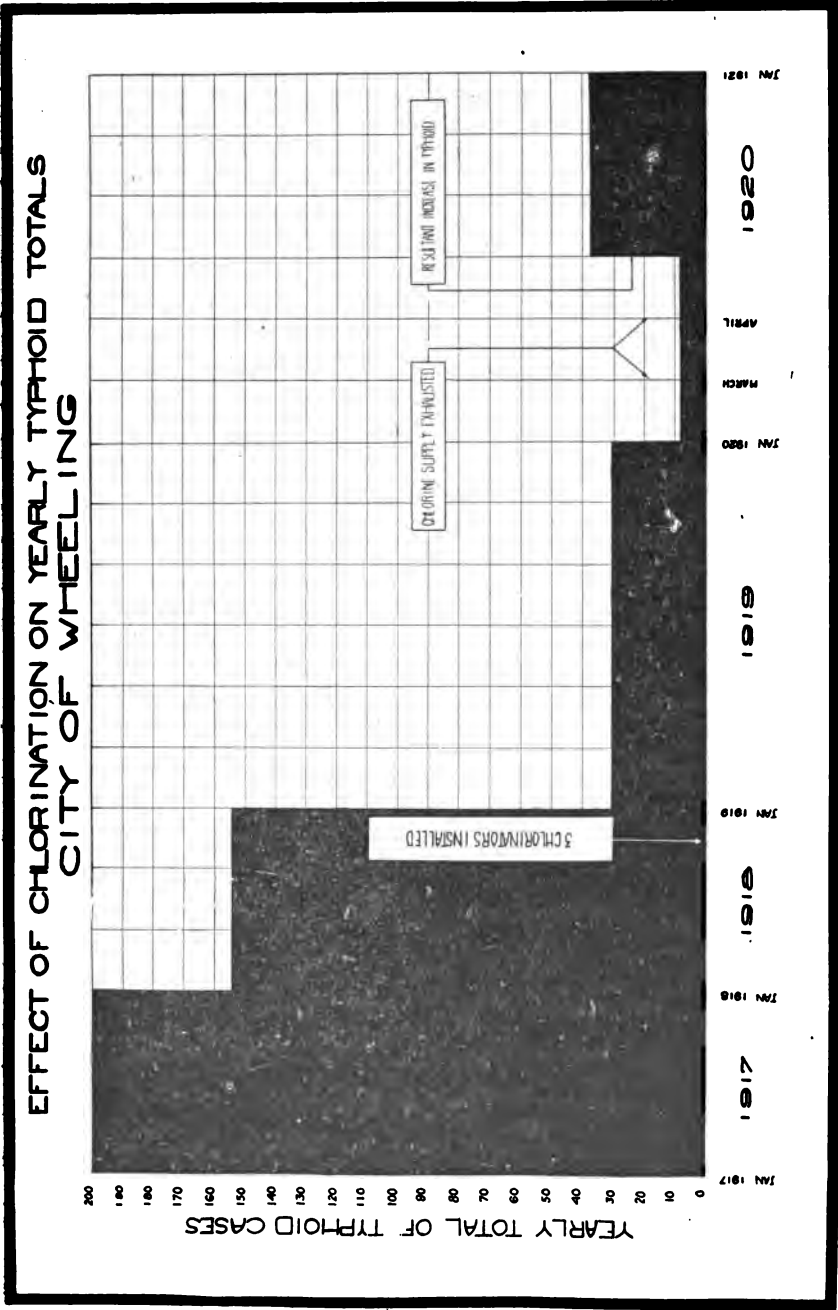






TYPHOID REDUCTION DUE TO IMPROVED WATER SUPPLY CONDITIONS  
CHARLESTON W VA. 1917-1920





### MISCELLANEOUS ACTIVITIES—OFFICE WORK.

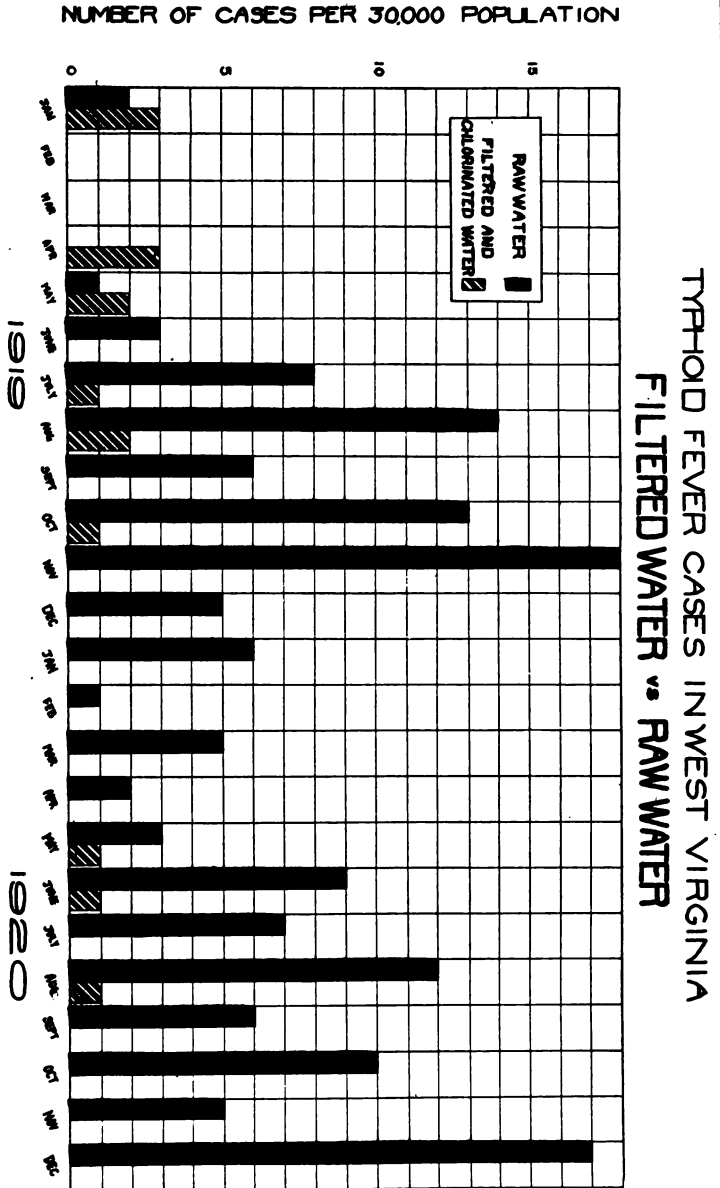
Work of considerable magnitude has been carried on in connection with the office in Charleston.

During April a booklet entitled, "Five Years of Sanitary Progress—Reducing the Typhoid Toll in West Virginia," was issued by this department. It was desired to present the progress made over the period 1915 to 1920 in order that the Legislature in session might see what the department is trying to do to make safer the public water supplies of the state. This bulletin contains some thirty-six pages. The work accomplished by the Division of Sanitary Engineering since its establishment is reviewed in connection with nineteen water borne typhoid epidemics in the state. These epidemics were due to (1) Use of raw untreated river water, (2) Inadequate filtration of river water, (3) Use of polluted well water, (4) Interruption in the chlorine disinfection of raw river water. Some of the charts in the booklet showing the growth of chlorinating plants, filtered and chlorinated water versus raw water, and chlorination versus filtration and chlorination in the state, are reproduced here since they show graphically that West Virginia is making progress.

Application blanks in the form of folders, on which towns and cities throughout the state may make preliminary application for permits with respect to new water and sewerage systems, have been designed. These forms enable the town authorities or consulting engineer, as the case may be, to state in a concise way the contemplated improvements. Thus an understanding of the project in question is brought about and the State Health Department can quickly review the final plans when permit is to be issued.

Forty or fifty stereopticon slides have been prepared. These are used in connection with different stereopticon lectures given by members of the staff, before Chamber of Commerce and civic organizations or other bodies of citizens who are interested in or boosting for municipal improvements, such as water filtration plants, sewerage systems or sewage disposal plants. The views have been selected with special reference to West Virginia conditions and bring out strongly the objective points in the stereopticon lecture.

Though the Sanitary Engineering Division of the State Health Department does not have a water analysis laboratory and actually carry out the bacteriological tests which are submitted monthly or at periods of three months from all public water supplies in the state, nevertheless, the results of the bacteriological examinations are sent to this division directly from the State Hygienic Laboratory and all interpretations on water reports are made by the engineers. This is in accord with the best practice, for this division has current information on conditions as they exist at the various towns and cities and this factor of sanitary survey is taken into account always in making the final interpretation before the report is sent out. This work of interpreting and sending out water reports consumes a considerable amount of time in respect to the office work. It is estimated



that at least thirty-three hundred interpretations on water reports have been made and sent out from this office in the past year.

A brief concise report of the most important activities of the sanitary engineers is written up for the bulletin issued by the West Virginia State Department of Health at intervals of three months. It is estimated that 20,000 of these bulletins are distributed at quarterly periods during the year.

The scope of work of the Sanitary Engineering Division is continually growing. To do the work effectively and promptly and to answer the calls for guidance and assistance coming each day from some section of the state, a larger staff of sanitary engineers is necessary. It has become recognized now by thinking men and women that life saving has a certain definite value measurable in dollars and cents. Reducing the typhoid death rate of West Virginia certainly is the work of the Sanitary Engineering Division and the high rate from this and other intestinal diseases, which formerly prevailed in the state, is coming down now and coming down fast as the speed of the health movement is accelerating to obtain pure water supplies and proper disposal of sewage.

With the proper reporting of vital statistics, now made possible in West Virginia through the operation of the Model Law for Registration, the declining death rate can be actually measured in the future and the economic gain in dollars and cents, as well as in human lives, recorded.

Respectfully submitted,

E. S. TISDALE, Director.

#### SUMMARY OF FIELD WORK LISTED ALPHABETICALLY.

##### Water Supplies, Sewerage, Other Activities.

**Alderson, Monroe County** — Typhoid outbreak necessitated the installation of the emergency chlorinating plant since the water being pumped to the town was badly contaminated. After a complete investigation had been made, following the installation of the emergency chlorinator, co-operative action was taken by the Chamber of Commerce and city officials to purchase a new chlorinating apparatus and emergency machine belonging to the state was removed.

**Harboursville, Cabell County** — Inspection of pump station and chlorinator operation. No spare parts for chlorinator available. Recommendations made that these be immediately obtained.

**Beards Fork, Fayette County** — Survey of mining town with special note of water supply conditions and body waste disposal. Both water supply system and sewage disposal methods satisfactory.

**Beckley, Raleigh County** — Inspection of water supply conditions showed that a new deep well had been sunk and that an additional supply of water of good quality was being furnished. This remedied the shortage of water which had previously existed in the town.

**Bluefield, Mercer County** — Upon request from the Bluefield Chamber of Commerce and city officials, engineers investigated the public water supply conditions. It was found that considerable pollu-

tion existed on the water-shed of the springs which furnish the city's water supply. A complete report upon Bluefield's water supply needs with reference to both the quality and quantity of the public water supply was submitted to the Chamber of Commerce and city officials.

**Braeholm, Logan County** — This mining community was advised, after investigation of the deep well water supply, to install an aerator to get rid of the objectionable iron found in the ground water. Suggestive plans showing proposed layout of aerator submitted to superintendent.

**Bower, Braxton County** — Inspection of new pump station to select the proper location for the new chlorinating equipment. Little Kanawha River water is being chlorinated and pumped to Bower, a mining community.

**Buckhannon, Upshur County** — Investigation of the water supply situation showed filter plant lying idle. Chlorinator was not working, due to air being trapped in the water line. Complete reorganization of water company is being carried out. As soon as new power plant is completed, filters will be again started. New duplicate chlorinator purchased and put into service immediately.

**Cameron, Marshall County** — Just previous to the vote on the bond issue for sewerage in Cameron, an address was given to the citizens of the town from the Chautauqua lecture platform, urging the passage of the bond issue for this much needed improvement. The bond issue was lost by the scant margin of ten votes.

**Cass, Pocahontas County** — Industrial chemical plant below Cass visited. Investigation of water supply situation made. Changes being made relative to chlorination practice.

**Catlettsburg, Kentucky** — Inspection of water system. Conditions very unsatisfactory. Chlorination of water, however, being carried on regularly with the new chlorinator. Filters should be entirely overhauled. Filtration plant necessary to give a satisfactory public water supply.

**Cedar Grove, Kanawha County** — Investigation of nuisances and insanitary privies. Arrangement made to have situation remedied.

**Charleston, Kanawha County** — Supervision of installation of recirculation pump and chlorinator on new swimming pool at Luna Park.

**Charleston, Kanawha County** — A week's study of the filtration practice at the rapid sand filter plant of the West Virginia Water & Electric Company was carried on. As a result of this study a report was sent to the water company setting forth in detail several necessary improvements which this department felt should be made so that the water might be kept always in proper condition, despite floods on the Elk River which serves as the source of supply.

**Charleston, Luna Park, Kanawha County** — Chlorinator to disinfect the water being recirculated at the new swimming pool at Luna Park was installed under the supervision of this division.

**Charles Town Jefferson County** — Inspection of new chlorinator installed to replace hypochlorite treatment.

**Clarksburg, Harrison County** — Three-day sanitary survey made of Clarksburg's most pressing sanitary problems, namely, sew-

erage, garbage disposal, milk supervision and health department conditions.

**Clarksburg, Harrison County** — Inspection of filtration plant with chemist in charge. Filter plant well supervised by chemist who formerly served as assistant engineer with State Department of Health. It was recommended that liquid chlorine treatment be substituted for the present system of hypochlorite dosage.

**Clarksburg, Harrison County** — The swimming pool in the High School building inspected. City water is furnished. Fil and draw principle is used with no recirculation, filtration or disinfection. Recommendations submitted for chlorination of water.

**Davis, Tucker County** — Pump station was being rehabilitated at time of investigation. Chlorinator not being used on account of ignorance and fear of the engineer at the station. Instructions given relative to the proper operation of the machine. Co-operation not satisfactory.

**Durbin, Pocahontas County**—Complete data obtained with regard to tannery of the Pocahontas Tannery Company. Disposal practice investigated.

**Elkins, Randolph County**—Re-inspection of water plant. Chlorinator giving good satisfaction.

**Elm Grove, Ohio County**—Inspection made of the rapid sand filtration plant operated by the Wheeling Public Service Company. Recommendations accepted regarding the installation of a small laboratory at the filter plant and running simple daily chemical tests to control intelligently the operation of the filter plant. Filters overhauled and new chemical dosing equipment and small laboratory completed. Daily reports filed with State Health Department.

**Fairmont, Marion County**—Investigation of swimming pool at the Y. M. C. A. showed conditions to be satisfactory. River water used. Filtration and recirculation system. Improvement could be made regarding disinfection treatment.

**Fairmont, Marion County**—Inspection of city water supply. Improvements being carried on at the city reservoir. Twenty million-gallon basin cleaned for the first time since it was put in service about 1906. Inspection of the chlorinator at pump station showed operation to be satisfactory. Filtration of the city water supply an imperative need.

**Grafton, Taylor County**—Inspection of Grafton pump station. Chlorinator not working. Conference with city officials relative to filtration plant for the city. Recommendations made for immediate purchase of the standard type of chlorinator since the one now being used is unsatisfactory and unreliable.

**Grantsville, Calhoun County**—Complete field survey of town to ascertain the possibilities for a satisfactory public water supply. Meeting with town council to set forth plans as to how a water supply system could be most economically built. Cost estimate was later made in report to the community. New public water supply will be built, an expenditure of \$12,000 having been authorized by a bond issue.



**Hamlin, Lincoln County**—Field survey of proposed new water supply. Conference with water company relative to location of reservoir and building system.

**Hinton, Summers County**—Inspection of filtration plant. Chlorinator not working. Superintendent agreed to cooperate with this department and operate pressure filters and chlorinator more intelligently. Co-operation has been lacking.

**Holden, Logan County**—Complete survey of the water supply situation. Conditions satisfactory.

**Huntington, Cabell County**—At request of special committee from Kiwanis Club, sanitary engineer visited city and investigated water supply conditions and visited filtration plant. Trip made by Kiwanis Club committee and city officials.

**Huntington, Cabell County**—Conference with water works officials. Arrangements made for having daily report of filter plant operation filed with the State Health Department.

**Logan, Logan County**—Visit to water works laboratory with superintendent of water company. Daily bacteriological tests are being carried on. Inspection at pump station showed hypochlorite treatment unsatisfactory and unreliable. Liquid chlorine treatment recommended. Favorable action taken by water company after the State Health Department and Public Service Commission had requested action. Considerable typhoid fever developed in this community during the two months previous to installing new equipment.

**Logan, Logan County**—Proposed sewerage system at Middelburg City investigated with local engineer. Plans to be drawn up and filed with division relative to system and sewage disposal. Since this community is located just above the Logan Water Company's intake, careful consideration has been given to the project.

**Madison, Boone County**—Preliminary survey for sewerage system. Local engineer to prepare complete plans for proposed system. These plans, after having been carefully reviewed by the State Health Department, proved satisfactory. Permit issued for the building of a sewerage system at a cost of \$35,000. Field survey of the public water supply at Madison showed conditions to be satisfactory. A safe water is being furnished to the community.

**Marlinton, Pocahontas County**—Union Tannery Company visited. Data obtained on the method of disposal of tannery wastes. Survey made of public water supply and since this is unsatisfactory due to the high iron content of the water, it is recommended that Knapps Creek be substituted, chlorinating the latter supply to safeguard it.

**Martinsburg, Berkeley County**—Inspection of watershed conditions near springs furnishing city water supply. Recommendations given city council regarding watershed control. At city council meeting addressed by State Health Commissioner and sanitary engineer, decision made by council to install liquid chlorine apparatus in place of hypo outfit.

**Middlebourne, Tyler County**—During the latter part of October, 1920, a shortage of water developed. It was necessary to supplement the well water supply with river water and to safeguard this source of sup-

ply with the emergency chlorinator owned by the State Health Department which was called into service. Middle Island Creek water was disinfected before being pumped into the town. An entire survey of the water situation in Middlebourne was made and recommendations given to the water company.

**Milton, Cabell County**—Inspection of water supply and sewerage conditions. Survey being made by consulting engineer for new sewerage system. These plans were presented to the Engineering Division of the State Health Department and approval given for system to be constructed. Bond issue failed.

**Monaville, Logan County**—Investigation of gravity filter which furnishes mining community with water. Recommendations made and favorably acted upon by the mining company officials.

**Monclo, Logan County**—Red water at this mining town is objectionable. Advice given relative to installation of aerator to remedy the trouble.

**Montgomery, Fayette County**—Inspection of water supply system following complaint from citizens of town regarding conditions at reservoir. Following recommendations, reservoir was cleaned.

**Montgomery, Fayette County**—City council requested the advice of the division with regard to garbage incinerator. A conference was held with city authorities relative to the location and make of incinerator. Ordinances governing garbage collection were also drawn up by the Engineering Division for the community.

**Morgantown, Monongalia County**—Instruction in summer camp sanitation given J. M. Brewster who will have charge of field work during summer.

**Morgantown, Monongalia County**—Bertha Mines visited. Typhoid fever outbreak investigated. Recommendations made for abandoning certain wells subject to contamination.

**Mt. Hope, Fayette County**—Shortage of water in this community. Auxiliary water supply obtained from Sugar Creek mine. Arrangements made for investigating this source of supply and for chlorinating it if necessary to render it safe for domestic use.

**Nitro, Putnam County**—Inspection of filtration plant and laboratory. Arrangements made for having daily reports of filter plant operation and of bacteriological tests submitted to the Engineering Division.

**Omar, Logan County**—Investigation of public water supply. Gravity filtration plant has been installed here to safeguard the water supply. Aeration resorted to previous to filtration to eliminate troublesome odors and tastes in supply.

**Oak Hill, Fayette County**—Complete survey of the water supply possibilities for this community made. A meeting was held with town officials in the evening and discussion of situation resulted in sufficient funds being raised to put down a deep well as a test.

**Parkersburg, Wood County**—Re-inspection of public water supply. Improvements in the filter units below the bed of the Ohio river have been completed. Two or three feet of new sand used to replace the dirty sand on filters. This action enables Parkersburg to obtain a sufficient supply of water although quality is not satisfactory. The rate

of chlorination has been increased to a considerable degree in an attempt to safeguard the public water supply. Daily water tests are made at the new city laboratory just completed.

**Parsons, Tucker County**—Re-inspection of water plant. Advised purchase of duplicate parts for chlorinator. Recommendations were adopted and spare parts are held on hand ready for any emergency.

**Parsons, Tucker County**—Sewerage system for the town proposed. Investigation made by engineer in the field to check over the plans which did not show all the features of the system. Agreements entered into with regard to installation of sewerage system.

**Peach Creek, Logan County**—Railroad water supply conditions investigated. Samples collected for bacteriological analysis.

**Philippi, Barbour County**—Inspection public water supply. Raw river water being pumped into the town. Immediate action requested to get this water disinfected by chlorine treatment. Delay in accepting recommendation, Engineering Division occasioned typhoid outbreak in community so that it was necessary to send sanitary engineer with emergency chlorinating apparatus owned by the state to Philippi. As soon as typhoid appeared in the community the water company made immediate purchase of a new chlorinator.

**Piedmont, Mineral County**—Complete water and sewerage maps of community obtained by field survey. Information furnished Maryland State Department of Health regarding these systems and also the status of the public water supply of Piedmont.

**Pt. Pleasant, Mason County**—Complete survey of public water supply which is obtained from deep wells. The extension of both water and sewers to suburb north of town was urged.

**Quinnimont, Fayette County**—Railroad water supply and town water supply investigated. Conditions satisfactory.

**Ripley, Jackson County**—Conference with the city officials regarding proposed filtration plant for community. Estimate made that filter could be installed for \$6,000 after preliminary reconnaissance had been made of the public water supply situation.

**Ronceverte, Greenbrier County**—Inspection of public water supply and chlorinator operation. The purchase of additional chlorinator equipment was advised and favorably acted upon by the town.

**Sistersville, Tyler County**—A visit of inspection was made to filtration plant supplying the public water supply. Question of submitting daily reports was discussed. Cooperation given by the town officials relative to daily reports and running chemical tests for control of filter plant not satisfactory.

**Spencer, Roane County**—The Sanitary Engineering Division made complete preliminary surveys for proposed sewerage system. It was necessary to prepare a detailed estimate for State Board of Public Works relative to cost of sewerage system for town since combined action by the state and town was essential in planning for sewerage system. Complete report filed with the Board of Public Works and hearing held before them asking that emergency legislation be passed by the West Virginia Legislature to provide necessary improvements.

Legislation was duly passed and money provided for constructing sewerage system.

**Thomas, Tucker County**—Investigation of public water supply showed raw surface water being pumped into the town. Old make of chlorinator unsatisfactory. Due to activity of mine physician, action was taken to install an improvised chlorinator designed by engineer at the mine. Thomas is one of the few communities not complying in the matter of reporting weekly relative to operation of chlorinator.

**Thurmond, Fayette County**—Railroad water supply conditions ascertained.

**Wellsburg, Brooke County**—Complete survey made of the public water supply situation. New well supply is to be substituted for the present unsatisfactory method of using water from a number of wells in the Ohio river, supplementing this ground water supply with contaminated Ohio river water. There is no safeguard on the present system and the water is dangerously contaminated.

**Weston, Lewis County**—Rapid sand filtration plant investigated. Filter plant has been completely overhauled. The reorganized water company have accepted recommendations to overhaul filter beds placing new sand in them, to repair wash water pump and install water testing laboratory. Daily reports sent to State Health Department.

**Weston, Lewis County**—Inspection of both pressure filtration plant and sewage disposal plant at Weston State Hospital. Pressure filters giving satisfactory service. Recommendations made regarding keeping of records of operation of the new sewage disposal plant recently completed here. Good cooperation given. Monthly report of operation of filters filed with State Health Department.

**Williamstown, Wood County**—The public water supply of this town is furnished by the Marietta Water Works located in Ohio. The filter plant is modern and is under competent daily supervision. A good quality of water is being furnished since the supervision of all filtration plants in Ohio by the Engineering Division of the Ohio State Health Department is well managed and high standards are maintained.

**Wheeling, Ohio County**—Inspections made at the city reservoir where chlorinating equipment is housed. There have been no interruptions in treatment of the city water. An emergency unit is always ready for instant service.

**Wheeling, Ohio County**—Indoor swimming pools at the Y. M. C. A. and the Y. W. C. A. visited. Recommendations made for adoption of chlorination at both pools. Outdoor swimming pool at Wheeling Fair Grounds also observed. Recommendations given relating to changes in the methods of chlorination.

**Wheeling, Ohio County**—Inspection of eleven pressure filters installed at the various public school buildings in the city. The recommendations of the State Health Department regarding the repair and overhauling of the school filters were followed and under supervision of the manufacturer, all pressure filters were put in good operating condition. Arrangements made for continuing the close supervision of these filters and submitting weekly reports to the State Health Department.

**Wheeling, Ohio County**—Talk given before the Pure Water Commission and the City Council of Wheeling. The new water supply to be developed from shallow wells was discussed after a complete field investigation had been made regarding this method of obtaining an improved water supply for the city. The project was not looked upon favorably by the State Health Department and so reported to the Pure Water Commission and City Council in joint session. At a later date a second conference was held at which R. C. Tarbett, Assistant Sanitary Engineer of the U. S. Public Health Service, was also present to discuss further Wheeling's public water supply. It was recommended both by the state and government sanitary engineers that the city install a modern water purification system of the rapid sand filter type.

Respectfully submitted,

E. S. TISDALE, Director.

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### REPORT OF THE STATE HYGENIC LABORATORY.

Dr. C. E. Gabel, Director.

Dr. W. T. Henshaw, Commissioner,  
State Health Department,  
Charleston, W. Va.

Dear Sir:

I have the honor to submit to you the following report for the activities of the Hygienic Laboratory for the year ending June 30, 1921.

Table I shows the kinds of examinations made and their number for each month of the year. The total of 9,326 shows that 1,766 more than three times the number for the year preceding that which was examinations were made than during the previous year and more the first year the laboratory was located in Charleston. Fewer specimens were sent to us for examination than in the previous year for typhoid, diphtheria and chemical examination, while the number was greater for venereal diseases, tuberculosis and water. The laboratory consists of five rooms and the following staff: Director, chemist, assistant bacteriologist, stenographer and part-time laboratory helper and janitress. The value of the laboratory to the physicians and other people of the state can be increased in future years if we can get more room and personnel to take care of the increased amount of work which might be done if the facilities for it were provided. More thorough examinations of the specimens could be made if time permitted, e. g., the confirmatory in addition to the presumptive test for colon bacilli in water. The public sometimes asks for more extended tests than we can make but it would often be unreasonable to accede to their requests. Thus a lumber company whose water was reported unsafe wrote: "Your report is so limited that it is not interesting to us. We would like to know in plain terms the different kinds of germs you find in each sample." Or men who have exposed themselves to a syphilitic infection the night before ask to have their blood examined to see if we can find the germ. This shows that the public

is realizing that valuable information can be gained by having laboratory tests made, however, they lack exact knowledge on the possibilities and limitations of such tests as carried out in practice.

Another popular illusion is that if typhoid is a water borne disease, it can be readily found in the water after the fever has developed. A well known authority says: "Up to the present time relatively few well-authenticated instances have been recorded in which the typhoid bacillus has been found in water \* \* \* it retains its vitality in natural bodies of water for at least four or five days \* \* \* but a steady decline in numbers goes on."

As the drop of dried blood sent us for the Widal test seems to be considered at times an infallible means of diagnosis, to show that such is not the case and that other and often better methods can and should be used, we revised and give below the circular of information on typhoid. We urge physicians to send us some of the patient's blood for cultural examinations as the best method of detecting the disease in the early stages. For detecting carriers, or those who may have been immunized by typhoid vaccine, feces may be sent for examination.

Intestinal parasites, which are very common in tropical countries, also exist in West Virginia. We found some in specimens sent in especially by one physician whereas very few specimens of feces have been sent in by others.

As the method of sending us specimens of water by express for bacteriological examination was very unsatisfactory, we devised a new container to be sent by parcel post. The old metallic container was alright theoretically, but when the sender failed, which was usually the case, to put ice in the compartment provided for that purpose or when the case was not delivered within forty-eight hours by the express company, which was frequently the case, it failed in its purpose, besides being clumsy and costly. We therefore obtained a light container of wood which can be sent more quickly by mail for six cents postage. However, we recommended the use of the old container in hot weather when it was possible to keep the specimens iced until they were examined.

In response to our circular letter recommending the new container we learned from those utilities responding that the average express charges were 97.5 cents for each time the analysis was made. The approximate difference in the cost of the two methods to a water company may be summarized thus:

	Old Method	New Method
Cost of container.....	\$14.00	\$1.00
Transportation on 20 shipments.....	19.50	1.20
Total .....	\$33.50	\$2.20

**WEST VIRGINIA STATE DEPARTMENT OF HEALTH.**  
**Hygienic Laboratory, Charleston.**

**Typhoid Diagnosis.**

In a suspected case of typhoid the bacteria may be isolated from the rose spots, the blood, feces, urine and more rarely from the sputum. The bacilli are present in the circulating blood of practically all patients during the early weeks of the disease and the disease can be detected by culturing the blood before the agglutination reaction of the Widal test becomes positive. Analysis of blood cultures gave the following results: During the first week 89% were positive, second week 73%, third week 60%, fourth week 38%, after the fourth week 26% were positive.

Add 1 to 2 cc. of blood to the tube of culture medium, pack well and return to laboratory.

The Widal test is not uniformly successful, especially from whole dried blood. The agglutination reaction rarely appears before the beginning of the second week but may continue six to eight weeks (in chronic infection of the gall-bladder for years). Send enough blood in a vial so that exact dilutions can be made of the serum. However, if necessary the test may be made on a single drop of dried blood. This should be placed on a piece of sheet metal or paper and air dried. Typhoid carriers usually give a Widal reaction, however, the most satisfactory method of detecting them is by

Feces or Urine Examination. Convalescents should be proven negative, by cultural procedure before discharging the patients. The stools are examined chiefly in obscure cases, typhoid bacilli having been isolated from ambulant cases so mild that they were not clinically suspected. Carriers have been known to harbor the bacilli for several years and though apparently well, may be the means of spreading the disease. In typhoid cases the bacilli can usually be isolated from stools toward the end of the second week. From the eleventh to the twentieth day 50% were found positive, twenty-first day to convalescence 81%. Typhoid bacilli can be found in the urine of about 25% of all patients, but rarely before the fifteenth day of the disease. They have been found weeks, months and even years after convalescence, (12% of cases during early days of convalescence). The bacilli usually appear and disappear with the albuminuria.

Amount of feces to be sent:  $\frac{1}{5}$  of total volume of emulsion, (urine  $\frac{1}{2}$ ). If you do not have our containers put suspected feces or urine in rubber stopped tubes with 30% glycerine in 0.6% Na Ce solution. Glycerine preserves specimens delayed in transit and inhibits colon more than typhoid bacilli. Blood for culture may be sent in rubber stopped tubes containing bouillon or 1% peptone solution with 1% sodium citrate.

Communications concerning specimens should be addressed to:

**STATE HYGIENIC LABORATORY,**  
**Charleston, W. Va., Box 1515.**

## MONTHLY SUMMARY OF EXAMINATIONS AT LABORATORY

TABLE I

Examinations Made From June 1, 1920 to May 31, 1921

Tests Made	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Total
Diagnostic:													
Typhoid.....	22	12	23	24	13	20	8	9	11	14	17	10	183
Para-typhoid.....			5							1			6
Tuberculosis.....	74	88	83	39	39	36	50	70	63	77	59	93	763
Diphtheria.....	8	6	9	12	31	47	35	22	33	50	11	7	277
Gonorrhea.....	11	34	22	28	23	27	29	21	28	33	34	45	335
Treponema.....	1	4	5	3	7	11	5	8	4	9	8	8	73
Wasserman.....	275	257	319	378	305	307	357	363	481	454	364	302	4,160
Miscellaneous.....	6	14	17	13	10	9	6	12	8	10	24	23	152
Water.....	281	315	197	212	270	206	271	348	230	332	290	293	3,241
Chemical.....	11	18	7	5	6	21	15	24	11	10	3	5	136
Summary.....	689	748	667	712	704	684	782	882	879	904	816	783	9,326
Total for the preceding year.....													7,590

TABLE II

Outfits Sent From State Hygienic Laboratory

1920	T. B.	Diph.	Widal	Gon.	Syph.	Ophth.	Para-sites	Water	Wass.	Urine	Total
June.....	84	112	52	15		140		85	240		728
July.....	102	38		36		47		224	202		709
August.....	84	32	22	25		62		141	206		572
September.....	48	195	18	57		98		167	298		851
October.....	27	53	20	15		92		108	252		571
November.....	46	36	33	39		55		142	312		663
December.....	76	24		38		65		235	265	12	715
1921											
January.....	109	58	29	10	4	106		332	302		950
February.....	94	93	32	41	14	91	52	257	344	15	1,033
March.....	67	35	48	16	4	65	4	284	319		853
April.....	71	36	8	26	6	100		262	390		911
May.....	54	26	26	50	1	40	2	223	198		620
Total.....	862	738	204	366	29	908	58	2,460	3,304	27	9,176

Respectfully submitted,

C. E. GABEL,  
Director.



## **SECOND ANNUAL REPORT.**

### **Division of Child Hygiene and Public Health Nursing.**

To Dr. W. T. Henshaw, Commissioner,  
State Department of Health,  
Charleston, West Virginia.

Dear Sir:

I have the honor to submit the following report covering the activities of the Division of Child Hygiene and Public Health Nursing from July 1, 1920, to June 30, 1921.

Owing to the fact that we have had four Health Commissioners within the year, our program, as planned, was necessarily somewhat hindered. Despite this fact, however, some progress has been made.

The personnel of the Division throughout this year has consisted of the Director, an Assistant Director and an office secretary.

### **PUBLIC HEALTH NURSING.**

Fifteen counties now have public Health Nursing Service. Thirty-four towns and communities have one or more nurses, making a total of eighty-four public health nurses employed within the State. These nurses are employed under the auspices of the Boards of Education, the Red Cross Chapters, Women's Clubs, County Tuberculosis Leagues, County Commissioners, Industrial Organizations, Municipal Organizations and Metropolitan Life Insurance Companies, or a combination of two or more of the above. Some of the nurses confine their activities to one phase of the work, such as school health work, tuberculosis, Metropolitan Life Insurance Company bedside care, etc., but fully one-third of the entire group, or more, are promoting a general health educational program. Twenty-one of these nurses are supplied with an automobile for use in the work, the remainder using railway or trolley transportation, a horse and buggy, or a horse in the more isolated and rugged sections, where no other means of transportation are practicable. Public Health Nurses are assisting with weekly health conferences in eight communities, and have assisted with demonstration health conferences in thirty-six communities during the year. Out of these has grown a marked increase of interest in better health, and in some instances it has resulted in the employment of a community or county nurse.

Eleven new Public Health Nursing Services have been established during the year, eight services have been enlarged, and two have been discontinued.

### **JOINT MEETING OF HEALTH OFFICERS AND PUBLIC HEALTH NURSING.**

Upon invitation from the State Public Health Council the Public Health Nurses met in joint session with the Health Officers of the State in April. The Public Health Nurses were given one session on the joint program, and one afternoon and two evening sessions were spent in round table discussions on problems in the Public

Health Nursing field, in a separate section of the Convention. Representatives of the State Board of Education, State Tuberculosis Association, Extension Division of the State University and Farm Bureau Clubs met with us in the round table sessions and took active part in the discussions.

### MATERNAL WELFARE.

Today we are realizing as never before that the power and wealth of a nation lie not only in the intelligence of its citizens, but also in the health that enables them to make best use of that knowledge. It is for this reason that we are bending our efforts toward the maternal problems of our State, since so much is dependent upon the health of the mother. "Good stock comes from inheritance, not by manufacture, as truly in men as in timber; men do not gather grapes from thistles, neither do strong constitutions as a rule spring from weak ancestors." Most of us realize that child bearing is one of the most dangerous occupations at present, but it is only made dangerous by lack of knowledge before, during and after birth. According to statistics, from the rural communities of six different States, 80 per cent of the pregnant women had received no advice or instruction during pregnancy. This percentage was found even higher in some localities.

There are no statistics available relative to this question in West Virginia, but we do know that the social and economic conditions surrounding the mother are not any better here than elsewhere. With this in mind we endeavored to meet the most outstanding problems, advising and instructing mothers and potential mothers how to care for themselves and their little ones.

### CHILD HEALTH CONFERENCES.

In addition to reaching as many mothers as possible of children in the pre-school age period, through helpful health literature and health films, posters, etc., the staff has assisted with the organization for, and conduction of, pre-school conferences, in eleven (11) communities at which eight hundred and eighty-six (886) children received a thorough physical examination by a physician and each mother had the advantage of a personal conference regarding the welfare of her child or children. Through the co-operation of the State Tuberculosis Association, the Child Welfare Committee of the State Federation of Women's Clubs and the Public Health Committee of the Farm Bureau of the State, we hope, during the coming year, to greatly multiply our usefulness to communities in this particular activity.

Mimeographed outlines have been prepared, giving the necessary organization for these conferences, from the beginning of the organization to the final tabulated report.

The object of these conferences is to help parents to know how to keep well children well and to discover physical defects early, so that they may be corrected before they become permanent handicaps, interfering with the child's physical, mental and moral development.

### SCHOOL HEALTH WORK.

In connection with the public health work in the schools of the State, the activities of this Division have been largely confined to helping the thirty-four (34) nurses doing school health educational work, in meeting and solving their problems, in helping them to enlarge and develop their programs, and in finding qualified public health nurses to fill open positions as requests are sent to us for such workers.

### CO-OPERATION WITH OTHER AGENCIES.

The Division of Child Hygiene and Public Health Nursing has had good co-operation with the American Red Cross, State Department of Education, State Tuberculosis Association, State Federation of Women's Clubs, United States Public Health Service, and Extension Division of Agricultural College of State University.

#### American Red Cross:

The Lake Division finances one Field Supervisor for the State office of Public Health Nursing. Also the local Chapters have financed nine (9) nurses throughout the year and helped to finance thirteen (13) others. However, the greatest contribution the Red Cross has made to the Public Health Nursing work of the State is that of the maintenance of high standards through its requirements for the nursing personnel. This has had its educational value throughout the State, and materially strengthened the State office in maintenance of the same standard for all Public Health Nurses, regardless of whether the nurses are employed by a Red Cross Chapter or some other agency.

#### State Department of Education:

The Public Health Nursing Division and the State Department of Education have worked together closely throughout the year in the health educational plans for the schools of the State. A school medical inspections card was worked out by the Division of Public Health Nursing in conjunction with the Division of Rural Sanitation, at the request of the State Board of Education, and these are furnished free of charge to all public schools. Also a duplicate copy of a compiled report on the work being done by school nurses throughout the State is sent from this Division to the State Department of Education each month.

#### State Tuberculosis Association:

The activities of the State Tuberculosis Association are very closely allied to this Division because of the Public Health Nursing program involved. There is a constant interchange of information and planning; also frequent conferences regarding organization and pooling of funds in local communities. The Division assists the State Tuberculosis Association, upon request, to find qualified Public Health Nurses for their various fields of work and the personnel of the Division frequently assists in special health campaigns put on by the Tuberculosis

Association in local communities, or sends a nurse to conduct a pre-school conference, which has been worked up by the survey organizer of that Association.

#### **United States Public Health Service:**

Upon appeal from the United States Public Health Service District Supervisor to this Division to help solve the health problems of the ex-service man with physical disability, the co-operation of the Public Health Nurses of the State has been given throughout the year to all such men located in communities or counties where Public Health Nurses are stationed. The nurses have visited the homes of these men, have given health instruction and many times have been valuable links between the government and these men. Where necessary these men have been kept on the follow-up list until otherwise provided for.

#### **State Federation of Women's Clubs:**

Upon request, the Director of the Division accepted the Chairmanship of the Child Welfare Committee in the State Federation of Women's Clubs, and together with the organized groups of women in the State, we are trying to work out some of the child welfare problems of the children of West Virginia. The program as outlined stresses three measures to meet outstanding needs.

1. Maternal welfare.
2. Pre-school child conferences.
3. Warm noon lunch in the rural schools.

#### **Extension Division of State University:**

The staff of the Division has assisted with the making of outlines and plans for health programs of the Extension Division, has arranged for medical inspection work similar to that carried on in schools, for the children attending the Prize Winner's Conference at the University, and assisted with the health program for the 4-H Camps of the Farm Bureau Boys' and Girls' Clubs. The reports for the medical inspection of the children attending the Prize Winner's Course, and also for the boys and girls of the 4-H Camps were compiled in our office. A copy of the compiled report in full, went to the Extension Division Headquarters, and to Counties also. A copy of the findings for each county, together with the record cards for that County, were sent to the Public Health Nurse of the County, where one is employed. Where a nurse is not employed, the report and record cards were sent to the Agricultural Agent and Home Demonstrator in order that some follow-up work may be done. More thorough and detailed co-operative plans are being worked out for the coming year, based on the experience of the last two years' work.

### MISCELLANEOUS ACTIVITIES.

Thirty-five (35) advisory visits have been made to nurses in the field and eighty (80) visits to local towns and communities in the interest of health education and health promotion. In forty-eight (48) of these communities talks have been given to groups, ranging from eight (8) to approximately one thousand (1,000) in number.

The field workers have directed and assisted in the organization and conduction of eleven (11) pre-school conferences in which eight hundred and eighty-six children (886) under school-age have been given a physical examination and personal or group conferences held with the mothers for the health promotion of their children and the correction of existing remedial physical defects.

Thirty-three articles have been prepared for the press and our section of the Quarterly Bulletin of the Department maintained in each of the four issues.

One thousand five hundred and thirty letters (1,530) have been written, seven hundred and eighty-three (783) interviews held, and the various members of the staff have participated in one hundred and sixty-three (163) conferences pertaining directly or indirectly to our health work.

### LITERATURE.

A large part of the health educational work of the Division has been carried on through the distribution of literature secured from the Children's Bureau, U. S. P. H. S., Federal Board of Education, National Tuberculosis Association, Child Health Organization, American Child Hygiene Association, American Playground & Recreation Association, and through material on rural sanitation prepared by our Division of Sanitary Engineering. All told, 61,625 pieces of literature from these various sources have been distributed throughout the State from this Division. Interest in the promotion of health has been stimulated to such an extent that every mail now brings requests for literature on health matters, and this is particularly true of teachers and pupils in the schools—the most effective avenue for health education.

West Virginia has made only a start toward meeting the health needs of her children. Where school medical inspection is being done the physicians and nurses are finding from 35 to 90 percent of the children with remedial physical defects. Many of these might have been prevented; most of them can be corrected.

Shall we not more thoroughly promote pre-school health work and send our children to school 100 percent fit; ready to receive the education, unhampered, that the schools are prepared to give them?

Shall we not go one step farther and attempt to see that each prospective mother has adequate health education and care, so that the children may enter life with a fair start and a good physical foundation upon which to build an all-around development, which is necessary in the making of "good citizens?"

"The race marches forward on the feet of little children."

Respectfully submitted,

Mrs. JEAN T. DILLON,

Director.

## REPORT OF THE DIRECTOR OF THE DIVISION OF PREVENTABLE DISEASES

Carl F. Raver, B. S., M. D., M. P. H.

### Epidemiologist

Dr. W. T. Henshaw,  
Commissioner of Health,  
Charleston, West Virginia

Dear Sir:

It gives me great pleasure to submit the following report of the Division of Preventable Diseases of the State Department of Health for the period extending from July 1st, 1920, to June 30th, 1921.

The work of this Division has not been carried on as vigorously as it should have been, because of the dividing of its activities between the regular work of epidemiology and that of vital statistics. For some years past, such vital statistics as were collected have been assembled under the supervision of this division and, when you remember that the office force consisted of the Director and two stenographers, you will appreciate that only by herculean efforts have we been able to keep our heads above water and make any progress whatsoever.

As the Department wished to secure a Division of Vital Statistics worthy of the name, it became necessary to secure the enactment, at the approaching session of the Legislature, of a modern vital statistics law. This important work was assigned to the director of this Division and his staff. To secure this law, a public sentiment favoring its enactment had to be created. Some 25,000 circular letters and pamphlets were sent out to the people of our State, explaining the need of this law. During the legislative session, a great deal of time and energy were expended with the various members of the Legislature, and I am glad to report that the bill was passed. I offer the above explanation to show why certain activities, that should have been carried on in the line of epidemiology, were allowed to drop for a time. It is my earnest wish that these two divisions be divorced and that a director be appointed for each.

During the past year we have had a great deal of sickness, as will be shown by a glance at the following summary. While it is true that the total number of cases is less than half of the number for the preceding year, it must be remembered that this falling off in the number of cases is due to the difference in Influenza reports, there being 38,852 less cases of that one disease alone.

Two other important facts are disclosed: the large increase in the number of cases of measles and the large decrease in the number of cases of typhoid fever. There has been a general epidemic of measles throughout the state, which accounts for the large increase shown. The decrease in typhoid fever, I believe, has been brought about by the activities of the Sanitary Engineering Department. This Division has kept close watch on all water supplies with great apparent benefit to the citizens of our state.

LANE LIBRARY

NAME OF DISEASE	Cases Reported July 1, 1919 to June 30, 1920	Cases Reported July 1, 1920 to June 30, 1921
Anthrax.....	3	1
Chickenpox.....	1,256	1,507
Diphtheria.....	2,708	2,103
German Measles.....	204	111
Hookworm Disease.....	.....	7
Hydrophobia.....	.....	4
Influenza.....	39,848	996
Measles.....	4,472	8,165
Meningitis, Cerebro-spinal.....	60	47
Ophthalmia neonatorum.....	24	15
Poliomyelitis.....	54	18
Scarlet Fever.....	2,467	2,160
Smallpox.....	2,615	2,950
Trachoma.....	111	31
Tuberculosis.....	446	270
Typhoid fever.....	1,658	956
Whooping Cough.....	1,943	2,751
Total.....	57,869	22,092





TABLE I  
Morbidity Report Showing Total Number of Cases Reported to the State Department of Health from Each County for the Twelve Months Period, July 1, 1920—June 30, 1921

	Anthrax	Chickenpox	Diphtheria	German Measles	Hookworm Disease	Influenza	Measles	Meningitis, Epidemic	Ophthalmia Neonatorum	Polio-myelitis	Rabies	Scarlet Fever	Smallpox	Trachoma	Tuberculosis	Typhoid	Whooping Cough
Barbour		24	10	1		15	25					27	22		2	38	25
Berkeley		5	70			1	3					16	2			7	62
Boone		6	3		3	4	22	1	1			9	21			27	62
Braxton		20	35			69	110	3				9	54		15	33	64
Brooke		11	30	1		4	58	1				26	9		5	6	6
Cabell		13	58			6	183	2				38	12		4	1	1
Calhoun		7	3				8					6			1	20	12
Clay		44	3	4			120					1	17		2	2	2
Doddridge		44	18	4		12	6	2				37	8		3	8	13
Fayette		199	135	12		36	1,779	5	9			103	109	3	7	66	420
Gilmer		3	3				13	1				43	27			5	26
Grant		6	3			8	57				4	69	15		2	5	5
Greenbrier		76	35	3		2	19	1				71	37		3	7	41
Hampshire		8	13				28	1		1		59	2		3	3	5
Hancock		10	18	1			2					31	2		3	15	15
Hardy		3	3				2					163	275		4	12	59
Harrison		45	201	5		10	14	6				7	6	14	6	3	179
Jackson		18	4			29	53			1		22	5		37	3	41
Jefferson		19	104	2		55	5			1		99	224	2	11	76	88
Kanawha		66	114	6		61	1,516	5	4			19	166		7	16	23
Lewis		8	26			15	63					9	2		8	3	95
Lincoln		31	3			10	237	2				2	93		2	21	17
Logan		52	13	4		1	328					17	166		18	22	58
McDowell		82	29		2	1	316	1				169	67	5	2	52	475
Marion		54	124	3		232	157	1	2			55	15		1	21	8
Marshall		5	28				150	2				29	20			6	62
Mason		37	7	5		10	5					9	20			24	135
Mercer		46	119	8		32	284	1	1			129	295			24	25
Mineral		34	30	1			27		1			30	176		2	24	25

Mingo	8	26	1	10	187		6	91	11	19	26
Monongalia	47	119	1	47	493	2	146	22	2	25	196
Monroe	4	21	1	28	43		34	7	1	27	18
Morgan	55	19	2	17	21		2	7	3	9	1
Nicholas	106	262		22	16		33	163	12	4	
Ohio				298	1	1	182	19	30	24	22
Pendleton		2		1	40		17			13	
Pleasant	1	10		10			14		1	12	13
Pocahontas	4	4		16	45		5		1	13	3
Preston	34	21	43	110	92		22	121	1	16	43
Putnam	1	13			58	2	29		2	13	9
Raleigh	41	34			346		14	48	3	16	93
Randolph	36	31	3	11	185		13	14	3	44	79
Richie	6	6		1	6		48	14	2	2	
Roane	1	15	6	1	21		14	3	1	44	
Summers	12	76	6	11	388	1	53	120	18	28	31
Taylor	6	35			9		87	40	1	13	13
Tucker	112	9		26	6	2	21	29	1	11	26
Tyler	7	19			16		38	91	1	2	
Upshur	17	6		12	32	1	10	36		10	33
Wayne	19	8		16	169		16	23	3	13	7
Webster	6	4		15	8	1	30	28		9	5
Wetzel	8	24		2	33	2	112		6	8	78
Wirt	3	85	1		47		7		2	9	111
Wood	6	1			6	1	39	23	6	19	10
Wyoming					34		34			2	2
Totals	1,507	2,103	111	996	8,165	47	2,160	2,950	31	270	2,751

(Table No. 2 is a detailed analysis of Table No. 1 and classifies the reported diseases by months for each county.)

TABLE 2  
Morbidity Report for Each County Classified by Months from July 1, 1920 to June 30 1921

	Anthrax	Chickenpox	Diphtheria	German Measles	Hookworm Disease	Influenza	Measles	Meningitis, Epidemic	Ophthalmia Neonatorum	Poliomylitis	Rabies	Scarlet Fever	Smallpox	Tetanus	Tuberculosis	Typhoid	Whooping Cough
Barbour:																	
July			2														
August																	
September			1														
October																	
November						3											
December			1														
January		2	1				4										
February		1	1				5										
March		4	2	1		11	6										
April		7				1	7										
May		2	3				3										
June		1															
Total	24	10	1	15	25	1	3					16	2		2	38	25
Berkeley:																	
July			2														
August			3				2										
September			1			1										1	
October			23														
November			10														
December			11														
January			11														
February			10														
March		5	1														
April																	
May			7				1										
June																	
Total	5	79	1	1	3	1	1					16	2		2	38	25

Booze:	July	August	September	October	November	December	January	February	March	April	May	June	Total
Brayton:													
July													
August													
September													
October													
November													
December													
January													
February													
March													
April													
May													
June													
Total	6	3	3	4	22	1	1						62
Brook:													
July													
August													
September													
October													
November													
December													
January													
February													
March													
April													
May													
June													
Total	20	35		69	110	3							64
Brook:													
July													
August													
September													
October													
November													
December													
January													
February													
March													
April													
May													
June													
Total	11	30	1	4	58	1							6

TABLE 2—Continued  
Morbidity Report for Each County Classified by Months from July 1, 1920 to June 30, 1921

	Anthrax	Chickenpox	Diphtheria	German Measles	Hookworm Disease	Influenza	Measles	Meningitis, Epidemic	Ophthalmia Neonatorum	Poliomylitis	Rabies	Scarlet Fever	Smallpox	Tetanus	Tuberculosis	Typhoid	Whooping Cough
<b>Cabell:</b>																	
July							1										
August																	
September																	
October			22					1									
November			10			1	3										
December			3				47	1									
January		4	6				106										
February		3	1														
March		4	1				3										
April		1	2				8										
May		1	1				12										
June																	
Total		13	58			6	183	2				38	12		1	20	1
<b>Callahan:</b>																	
July																	
August																	
September			3														
October																	
November																	
December																	
January																	
February																	
March																	
April																	
May																	
June																	
Total		7	3				8					6			4	2	12



TABLE 2—Continued  
Morbidity Report for Each County Classified by Months from July 1, 1920 to June 30, 1921

	Anthrax	Chickenpox	Diphtheria	German Measles	Hookworm Disease	Influenza	Measles	Meningitis, Epidemic	Ophthalmia Neonatorum	Polymyelitis	Rabies	Scarlet Fever	Smallpox	Tuberculosis	Typhoid	Whooping Cough
<b>Gilmer:</b>																
July.....		2					13									
August.....																
September.....												9				
October.....			5									12				5
November.....												7				
December.....												6	6			
January.....		1										8	6		1	
February.....								1				6	6			
March.....												8	6			
April.....												1	1			18
May.....												1	1		2	
June.....													1		2	
Total.....		3	3				13	1				43	27		5	26
<b>Grant:</b>																
July.....			1													
August.....												1				
September.....																
October.....															4	
November.....			2											1		
December.....													5			
January.....												1	2			
February.....		2					5						1		1	
March.....		3											13			
April.....		1											25			
May.....													6			
June.....												1	3			
Total.....		6	3				5					3	64	2	5	

[illegible]



TABLE 2—Continued  
Morbidity Report for Each County Classified by Months from July 1, 1920 to June 30, 1921

	Anthrax	Chickenpox	Diphtheria	German Measles	Hookworm Disease	Influenza	Measles	Meningitis, Epidemic	Ophthalmia Neonatorum	Polymyelitis	Rabies	Scarlet Fever	Smallpox	Tetanus	Tuberculosis	Typhoid	Whooping Cough
Hardy:																	
July																	1
August																	
September																	
October																	
November																	
December																	
January																	
February																	
March																	
April																	
May																	
June																	
Total			3			10	2					31	2		3	15	
Harrison:																	
July			10				3					14	10			5	
August			18									6	12			2	
September			13									10	12			1	
October			39									15	26			2	
November			28									15	30			1	
December			48									15	30				
January			32									12	79				
February			6									12	42				
March			1									10	33				
April			4									21	9				
May			2									23	9				
June			2									4	4				
Total		45	301	5		27	14	6				163	275		4	12	59



TABLE 2—Continued  
Morbidity Report for Esch County Classified by Months from July 1, 1920 to June 30, 1921

	Anthrax	Chickenpox	Diphtheria	German Measles	Hookworm Disease	Influenza	Measles	Menigitis, Epidemic	Ophthalmia Neonatorum	Poliomylitis	Rabies	Scarlet Fever	Smallpox	Trauma	Tuberculosis	Typhoid	Whooping Cough
<b>Lewis:</b>																	
July.....		1	2				1					1				3	7
August.....			1									4			2	1	4
September.....			3									2				2	1
October.....			6			5						2				2	6
November.....			3			1	1					2	12		2		
December.....			4			1	1					3	18		1		
January.....		2	3			8	3					3	46			1	
February.....			1			1	3					3	29			1	2
March.....							3					2	16			3	1
April.....			1				33					1	19		1	1	3
May.....			1				19					1	10		1	1	1
June.....			1									1					
<b>Total.....</b>		8	26			15	63					19	166		7	16	23
<b>Lincoln:</b>																	
July.....						1	3					1					
August.....																	
September.....						2						3			1	1	3
October.....		9				3	8	1				3			1		16
November.....		6	2			2	110								1		28
December.....		9	1			3	59	1							1		22
January.....		5					35										18
February.....		2				1	15										4
March.....							2						2		3		
April.....							2								1		2
May.....							5									2	
June.....						1											
<b>Total.....</b>		31	3			10	237	2				9	2		8	3	95

<b>Logan</b>											
July											
August											
September											
October											
November											
December											
January											
February											
March											
April											
May											
June											
Total	52	13	4	1	328				7	63	2 21 17
<b>McDowell</b>											
July											
August											
September											
October											
November											
December											
January											
February											
March											
April											
May											
June											
Total	82	29	2	1	316				17	166	18 22 58
<b>Marion</b>											
July											
August											
September											
October											
November											
December											
January											
February											
March											
April											
May											
June											
Total	54	124	3	232	157	1	2		169	67	5 2 52 475

TABLE 2—Continued  
Morbidity Report for Each County Classified by Months, from July 1, 1920 to June 30, 1921

	Anthrax	Chickenpox	Diphtheria	German Measles	Hookworm Disease	Influenza	Measles	Meningitis, Epidemic	Ophthalmia Neonatorum	Polymyelitis	Rabies	Scarlet Fever	Smallpox	Trachoma	Tuberculosis	Typhoid	Whooping Cough
Marshall:																	
July.....			1				1					3	2			3	3
August.....			3				1					1				6	5
September.....							4					14				2	2
October.....			4									4				1	
November.....			2									5					
December.....			5				83					5	1				
January.....		1	1				41	2				9	2				1
February.....		3	5				9					7	1				
March.....			5				9					6	2				
April.....			2				6					4	6		1		
May.....		1	3				3					6					
June.....							3					1					
Total.....	5	5	28				150	2				55	15		1	21	8
Mason:																	
July.....							3										30
August.....													4			1	14
September.....			6													2	4
October.....							2									2	3
November.....												3					3
December.....			1									2	2			3	2
January.....		3										2	5				2
February.....		10					3					2	4				4
March.....		18		4								2	1				
April.....		6		1													
May.....																	
June.....							3										
Total.....	37	37	7	5		10	5					9	20			6	63

## Mecon:

July	4	3	4	39	1	1	1	19	2	3	5
August	4	4	4	4	1	1	1	4	1	3	22
September	1	1	1	10	1	1	1	20	1	3	16
October	38	3	3	3	1	1	1	13	1	6	10
November	2	24	24	9	1	1	1	24	2	2	2
December	1	15	4	20	1	1	1	12	1	3	1
January	9	9	3	63	1	1	1	21	2	2	7
February	2	5	4	67	1	1	1	25	2	2	1
March	3	4	4	20	1	1	1	48	1	1	19
April	7	5	4	18	1	1	1	78	1	1	45
May	4	4	4	12	1	1	1	36	1	2	11
June	5	1	1	3	1	1	1	11	1	2	135
Total	46	119	3	32	261	1	1	129	295	24	135

## Total

## Mineral:

July	3	1	1	19	1	1	1	5	1	5	2
August	1	1	1	1	1	1	1	1	1	1	1
September	6	1	1	5	1	1	1	2	1	5	2
October	1	1	1	1	1	1	1	1	1	5	1
November	3	3	3	1	1	1	1	13	2	5	2
December	5	5	5	1	1	1	1	31	3	3	10
January	4	2	2	1	1	1	1	39	2	2	1
February	8	4	4	1	1	1	1	40	2	2	2
March	9	1	1	1	1	1	1	30	1	1	1
April	11	2	2	1	1	1	1	11	1	1	1
May	2	2	2	1	1	1	1	10	1	1	1
June	2	2	2	1	1	1	1	1	1	1	1
Total	34	30	1	27	1	1	1	30	176	24	25

## Total

## Minn:

July	1	1	1	1	1	1	1	1	1	4	3
August	1	1	1	1	1	1	1	1	1	4	3
September	3	3	3	2	1	1	1	1	1	13	16
October	6	6	6	6	1	1	1	1	1	3	1
November	5	5	5	2	1	1	1	1	1	20	7
December	4	4	4	2	1	1	1	9	2	2	1
January	2	2	2	12	1	1	1	28	1	1	1
February	1	1	1	9	1	1	1	18	1	1	1
March	1	1	1	34	1	1	1	7	1	1	1
April	1	1	1	16	1	1	1	1	1	1	1
May	1	1	1	1	1	1	1	1	1	1	1
June	1	1	1	1	1	1	1	1	1	1	1
Total	8	26	1	10	187	1	1	6	91	11	26

## Total

TABLE 2—Continued  
Morbidity Report for Each County C assified by Months from July 1, 1920 to June 30, 1921

	Anthrax	Chickenpox	Diphtheria	German Measles	Hookworm Disease	Influenza	Measles	Meningitis, Epidemic	Ophthalmia Neonatorum	Polomyelitis	Rabies	Scarlet Fever	Smallpox	Trachoma	Tuberculosis	Typhoid	Whooping Cough
Monongalia:																	
July		5	3			1	38					5	13	2	1	3	3
August			5				39					2			2	3	2
September			15			12	25					14			1	3	2
October			20			6	17					8				4	3
November	1		12			29	93					10			3		2
December		7	16			8	91					17					53
January		20	13			20	47	2				28				1	56
February		5	13				107	2				37				1	27
March			0				5					14	4			1	11
April			3				2					8	5			2	2
May		1	3									3					1
June												3			2		2
Total	1	47	119			47	493	2		3		146	22	2	10	25	196
Monroe:																	
July			1				2									4	
August							1					3				4	
September												3				2	
October																5	
November			6	1			11					10					15
December						5	7					4				1	
January						7	8					1				2	
February			2			1	10					3				3	
March			4			5	4					5				4	
April						7						2					3
May						3						1					
June			3									3			1	3	
Total			21	1		28	43					34			1	27	18





**TABLE 2—Continued**

[illegible]

[illegible]

TABLE 2—Continued  
Morbidity Report for Each County Classified by Months from July 1, 1920 to June 30, 1921

	Anthrax	Chickenpox	Diphtheria	German Measles	Hookworm Disease	Influenza	Measles	Meningitis, Epidemic	Ophthalmia Neonatorum	Poliomylitis	Rabies	Scarlet Fever	Smallpox	Typhoid	Tuberculosis	Typhoid	Whooping Cough
Hardy:																	
July																	
August																	
September																	
October																	
November																	
December																	
January																	
February																	
March																	
April																	
May																	
June																	
Total			3			10	2					31	2	15	3		
Harrison:																	
July			10				3					14	10	5			
August			18	3				1				10	12	3			
September			13									10	12	1			6
October		3	39									15	26	1			
November			28					1				15	20				
December			48				1					15	30				6
January		10	48				1					12	79				8
February		12	32	1			4	1				12	43				15
March		5	4	2			3	2				10	33	1			6
April		9	4	4			5					23	9				9
May		2	4	4			7	1				27	9				
June			2									4	4				
Total		45	201	5		27	14	6				163	275	12	4		59

[illegible]

TABLE 2—Continued  
Morbidity Report for Each County Classified by Months from July 1, 1920 to June 30, 1921

	Anthrax	Chickenpox	Diphtheria	German Measles	Hookworm Disease	Influenza	Measles	Meningitis, Epidemic	Ophthalmia Neonatorum	Poliomyelitis	Rabies	Scarlet Fever	Smallpox	Trauma	Tuberculosis	Typhoid	Whooping Cough
Lewis:																	
July		1	2				1					1				2	7
August			1									4				1	4
September			3									2				1	1
October			6			5						2				2	2
November			3				1					2					6
December			4										12				
January			1			1							18				
February		3	2			8	3					3	46		1	1	2
March			1				3					2	29				
April			1				3					1	16			1	1
May			1				33					1	19			2	3
June			1				19					1	10		1	1	1
Total		8	26			15	63					19	166		7	16	23
Lincoln:																	
July						1	3					1					
August																	
September												3					
October						2						2			1	1	3
November		9	2			3	8	1				3			1		16
December		6	1										8		1		28
January		9	1				110						59		1		22
February		5						1					1		1		18
March		2				1	35										4
April							15								3		2
May							2						2		1		3
June						1	5									2	2
Total		31	3			10	237	2				9	2		8	3	95

[illegible]

TABLE 2—Continued  
Morbidity Report for Each County Classified by Months, from July 1, 1920 to June 30, 1921

	Anthrax	Chickenpox	Diphtheria	German Measles	Hookworm Disease	Influenza	Measles	Meningitis, Epidemic	Ophthalmia Neonatorum	Polomyelitis	Rabies	Scarlet Fever	Smallpox	Tuberculosis	Typhoid	Whooping Cough
Marshall:																
July...								1								
August...			1					1								
September...																
October...								1								
November...								1								
December...								1								
January...							1	1								
February...		1					1	1								
March...							1	1								
April...							1	1								
May...		1					1	1								
June...							1	1								
Total	5	5	28				150	2				55	15	1	21	8
Mason:																
July...								3								
August...																
September...			6													
October...							2									
November...		3	1													
December...		10														
January...		18		1		3										
February...		6				4										
March...						3										
April...																
May...																
June...																
Total	37	71	5	10	5	10	5					9	20		6	82

Menger											
July...	4	2			39					18	5
August...		4		1						7	22
September		7								20	16
October...	2	28			4	10				22	6
November	1	24			3					13	2
December	9	15			24	9				21	2
January...	7	15			4	20				12	2
February...	2	9		3		65				31	7
March...	2	2				67				25	19
April...	2	5				20				8	48
May...	5	4				18				8	1
June...	5	1				12				3	46
					5					11	2
Total	46	119	3	1	32	264	1	1		129	295
Mineral:											
July...											
August...		2	1			19				5	1
September		1									5
October		6				5				2	1
November		3						1		2	13
December		1								2	5
January	4	2				1				9	10
February	8	4								2	39
March...	9									4	46
April...	11	1								2	30
May...	2	3								11	3
June...		2								3	10
										1	
Total	34	30	1	1		27		1		30	25
Mingo											
July...		1									
August...	2	3	1			1				1	4
September	3				2						3
October											13
November		6				11					
December	5	5								1	16
January...	2	4			6					2	
February	1	1			2	12				3	2
March...	1	1				29				20	7
April...						94				28	
May...						34				18	
June...						16				7	
										1	4
Total	8	26	1		10	187				6	26



TABLE 2—Continued  
Morbidity Report for Each County Classified by Months from July 1, 1920 to June 30, 1921

	Anthrax	Chickenpox	Diphtheria	German Measles	Hookworm Disease	Influenza	Measles	Meningitis, Epidemic	Ophthalmia Neonatorum	Polio-myelitis	Rabies	Scarlet Fever	Smallpox	Trachoma	Tuberculosis	Typhoid	Whooping Cough
<b>Monongalia:</b>																	
July.....		5	3			1	38					5	13	2	1	1	3
August.....			3				30					2			2	2	2
September.....			15				25					14			1	1	20
October.....			15			12	17					14			1	1	20
November.....	1	7	20			16	29					10			1	1	23
December.....		20	12			8	93					10			3	4	52
January.....		9	16			20	91					17			1	1	56
February.....		5	13			20	47	2		2		28			1	1	27
March.....		9	13				107	2				14				1	11
April.....		7	9				5			1		14					2
May.....		1	3				2					8			2		
June.....												3					
Total.....	1	47	119			47	493	2		3		146	22	2	10	25	196
<b>Monroe:</b>																	
July.....			1				2					2				4	
August.....							1					3				2	
September.....												4				5	
October.....			6				11					4				1	15
November.....				1			7					10					
December.....			1			5	8					3				2	
January.....			2			1	10					3				2	
February.....			4			1	4					2				4	
March.....						1	3					1				1	3
April.....			3									3				2	
May.....												1					
June.....												3					
Total.....			21	1		28	43					34			1	27	18

Morgan:											
July...											
August	2										
September											
October											
November											
December											
January	2										
February											
March											
April											
May											
June...											
<b>Total</b>	4	2				17	21				
Nicholas:											
July...											
August											
September											
October											
November											
December											
January	3										
February	34										
March	15										
April	1										
May											
June...	2										
<b>Total</b>	55	19				22	16				
Ohio:											
July...											
August											
September	1										
October											
November	6										
December	11										
January	14										
February	18										
March	28										
April	13										
May	12										
June...	3										
<b>Total</b>	106	282					298	1			

TABLE 2. Continued  
Mortality Report for Each County Classified by Month, from July 1, 1917, to June 30, 1918

Per Year:	July	August	September	October	November	December	January	February	March	April	May	June	Total
Barren													1
Boone													10
Calhoun													
Clay													
Conaway													
Crawford													
Fayette													
Greenup													
Harlan													
Harrison													10
Jefferson													
Lincoln													
Mason													
Mingo													
Monroe													
Myers													
Nelson													
Putnam													
Rockwell													
Salem													
Shelby													
Summers													
Taylor													
Todd													
Wagner													
Wayne													
West													
Wood													
Wyatt													
Yule													
Total													

Pleasants:

July  
August  
September  
October  
November  
December  
January  
February  
March  
April  
May  
June

Total

Peaches:											
July											
August											
September											
October											
November											
December											
January											
February											
March											
April											
May											
June											
Total	4	4			16	45					
Preston:											
July											
August											
September											
October											
November											
December											
January											
February											
March											
April											
May											
June											
Total	34	21	43		110	92					
Putnam:											
July											
August											
September											
October											
November											
December											
January											
February											
March											
April											
May											
June											
Total	1	13				58					

TABLE 2—Continued  
Morbidity Report for Esch County Classified by Months, from July 1, 1920 to June 30, 1921

	Anthrax	Chickenpox	Diphtheria	German Measles	Hookworm Disease	Influenza	Measles	Meningitis, Epidemic	Ophthalmia Neonatorum	Polio-myelitis	Rabies	Scarlet Fever	Smallpox	Trachoma	Tuberculosis	Typhoid	Whooping Cough
<b>Raleigh:</b>																	
July		9	1			4	27	1				5	6			2	1
August		3					1									1	
September							42					1	5		1	1	5
October			1				62					2				1	16
November			1				17					1					2
December		3	12				11					1	17		1		10
January			6				75					1	2				
February		6	3				33					2	2				22
March		6	3				46					3	3			1	24
April		10	3				13					3	3			1	
May		3	3				3										
June							8										3
<b>Total</b>	41	34	34				346	2				14	48		3	16	83
<b>Randolph:</b>																	
July							11					1					5
August			1				4					2					6
September			9				15										10
October	4	4	4			6										14	19
November	4	3	3				1					1			2	18	
December	9	3	4				1					1			2	3	
January	6	6	3				10						6			3	
February	6	6	3				89					9				2	23
March	1	6	3	1			61								1	2	
April		1	3	2			22									1	
May							1										
June																	
<b>Total</b>	36	31	31	3		11	185					13	14		3	44	79

[illegible]

TABLE 2—Continued  
Mortality Report for Each County Classified by Months, from July 1, 1920 to June 30, 1921

	Anthrax	Chickenpox	Diphtheria	German Measles	Hookworm Disease	Influenza	Measles	Meningitis, Epidemic	Opthalmia Neonatorum	Polomyelitis	Rabies	Scarlet Fever	Smallpox	Trachoma	Tuberculosis	Typhoid	Whooping Cough
Taylor:																	
July												14	15				
August												12					
September												12					
October												12					
November												12					
December												12					
January												12					
February												12					
March												12					
April												12					
May												12					
June												12					
Total		6	35			9	9					87	40		1	13	13
Tucker:																	
July																	
August																	
September																	
October																	
November																	
December																	
January		6	1			3	3										
February		10	1			3	3										
March		11				3	3										
April		10				3	3										
May		22				3	3										
June		28				3	3										
Total		112	9			20	6	2				21	20			1	20

[illegible]



TABLE 2—Continued  
Morbidity Report for Each County Classified by Months, from July 1, 1920 to June 30, 1921

	Anthrax	Chickenpox	Diphtheria	German Measles	Hookworm Disease	Influenza	Measles	Meningitis, Epidemic	Ophthalmia Neonatorum	Polomyelitis	Rabies	Scarlet Fever	Smallpox	Trachoma	Tuberculosis	Typhoid	Whooping Cough
Webster:																	
July.....							6									2	
August.....												7				1	
September.....												11					
October.....			2			9										3	
November.....																	
December.....												5				1	
January.....		1				1						5	2				
February.....			1			3							2				
March.....			1										2			1	
April.....			1			2	1					4	4			1	5
May.....							1	1									
June.....																	
Total.....		6	4			15	8	1				30	28			9	5
Wetzel:																	
July.....																1	4
August.....			1			2										2	2
September.....			3													1	6
October.....						2									3		
November.....			11														
December.....																	
January.....		5											7			1	5
February.....		3	2										72			1	
March.....							5						18				25
April.....							26						6				25
May.....		1											9				11
June.....							1	2								4	
Total.....		8	24			2	33	2					112		6	8	78



TABLE 3  
Morbidity Report Classified to Show Number of Cases of Disease Reported Each Month, from July 1, 1920 to June 30, 1921

DISEASE	July	Aug.	Sept.	Oct.	Nov	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
Anthrax					1								1
Chickenpox	82	32	19	42	112	176	338	243	138	199	99	27	1,507
Diphtheria	56	66	139	384	378	290	263	158	142	100	61	66	2,103
German Measles	2	6	3	5	7	1	63	7	10	6	1		111
Hookworm Disease	1			2				2	1	1			7
Hydrophobia													4
Influenza	26	8	107	135	116	127	111	162	84	73	36	11	996
Measles	425	107	110	163	219	463	1,815	2,184	1,420	834	290	135	8,165
Meningitis	2	6	2	1	5	2	5	8	5	7	2	2	47
Ophthalmia													
Meonatorum		1		2	1		1	4	5	1			15
Poliomyelitis		3	1	2	4		1	2	1	1		3	18
Scarlet Fever	107	72	124	296	229	228	295	209	211	179	147	63	2,160
Smallpox	155	99	97	85	110	255	512	472	459	399	225	82	2,950
Trachoma	8	4	9	3			2	2		2	1		31
Tuberculosis	36	30	26	13	17	17	29	22	32	14	18	16	270
Typhoid	135	106	114	138	79	64	66	62	56	47	41	48	956
Whooping Cough	223	122	122	258	325	342	380	266	229	218	174	92	2,751
Totals	1,258	662	873	1,529	1,603	1,965	3,881	3,803	2,797	2,061	1,095	545	22,092

### REPORTING OF DISEASE

It has been a constant desire on our part to secure as prompt and accurate reports of disease as may be. The physicians of our state have been coaxed and urged repeatedly to report their cases to the health officers having jurisdiction over the territory in which the cases occur. Many of them do so, still we feel that a large number of cases go unreported. Health officers cannot take proper precautions against the spread of disease unless they know of its presence. A few of our health officers fail to report unless reminded of their duty each week. This makes for a great deal of unnecessary correspondence which could be eliminated if these health officers would report each week, as they should.

A table showing number of reports received, and by whom the reports were made, follows:

TABLE 4

MONTH OF	Number County Health Officers Reporting	Number Reports Received from County Health Officers	Number City Health Officers Reporting	Number Reports Received from City Health Officers	Total Number Reports Received
1920					
July	52	229	78	356	585
August	52	179	76	274	453
September	51	186	78	280	466
October	54	228	76	349	577
November	53	188	78	291	479
December	54	186	76	285	471
1921					
January	54	236	76	345	581
February	53	183	78	281	464
March	53	181	83	293	474
April	52	225	83	356	581
May	53	173	80	264	437
June	47	134	63	195	329
Total	630	2,328	925	3,509	5,897
Aver. per month	52.5	194	77.08+	297.41+	491.41+

## EPIDEMIOLOGICAL INVESTIGATIONS.

## INVESTIGATION OF COCKROACH INVASION AT HUNTINGTON AND PARKERSBURG

Answering a request from Dr. H. E. Gaynor for an investigation of the cockroach menace to the citizens living near the dump in Parkersburg, Dr. S. L. Jepson directed that I proceed to that city by way of Huntington, stopping there to make inquiry into Huntington's cockroach troubles, and to find out what measures the authorities of Huntington had adopted to rid their city of this pest.

I arrived at Huntington Friday afternoon, September 3d, and immediately called upon Dr. A. J. Pickering, the City Health Officer, who told me the following facts: In the early spring, large numbers of cockroaches were noticed at the city dump at 14th Avenue, at which place a goodly portion of garbage is dumped by the city in the sand pit; this garbage being covered with sand shortly after it is placed there. No attention was aid at first by the city officials of Huntington to the complaints aroused by the cockroach invasion, and the cockroaches increased in size and number. After four months, they became so numerous and had infested the houses near the dump to such an extent, that some of the property owners entered suit for damage against the city and, as a result of this suit, the officials made an effort to clean up the cockroaches.

There were three kinds of cockroaches in Huntington, styled: the English, German and Australian. To get rid of these pests, three different chemical poisons were tried, but no results were noticed. At last, it was decided that if the dump could be saturated with gasoline and burned, some positive results might be secured in the way of eliminating the pest. Consequently, the city made arrangements with the fire department to set the dump on fire and to watch the fire. After placing several barrels of gasoline on the dump, it was set on fire.

Dr. Pickering reports that this method was entirely satisfactory and upon my visit to the dump, while I was able to find evidence of all three strains of cockroaches, they were not very numerous.

The fire burned about a day and a half, but was under control all of the time and did not become a menace to the surrounding property. There was some odor disseminated over the city at the time of the burning. The opinion of the Huntington officials is that the cockroaches will not bother them further and if they do, another burning will accomplish the complete removal of the trouble.

On Saturday, September 4th, I visited the Parkersburg dump, which is located in the city, but is used only for old papers, boxes and rubbish, and not for garbage. Accompanied by Mr. Knight, Sanitary Inspector, I made a thorough examination of this dump and was unable to find even one cockroach, although nearby neighbors stated there were cockroaches in the houses and they could be found after dark. It is evident that there were not nearly as many cockroaches at Parkersburg as at Huntington.

After discussing the situation with Mayor Dunn and Mr. Simpson, Commissioner of Public Safety, and Dr. W. B. Richardson, City Health

Officer, it was decided that the dump should be burned as was done in Huntington, proper preventive measures being taken to eliminate any spread of the fire. In the opinion of the city officials, there is only one objection to the burning of dumps, and that is, that the fire may burn back into the dump, creating a nuisance in the form of smoke and disagreeable odors, and when once it has burned back into the dump and away from the water thrown upon it, it burns on indefinitely and cannot be controlled. This is a possibility but if understood and properly watched at the time of the fire, it can be controlled satisfactorily.

### INVESTIGATION OF TYPHOID FEVER AT SOUTH CHARLESTON

On September 17th, 1920, at the request of Dr. R. H. Dunn of South Charleston, I made a trip to that city to investigate the report that there was a person suffering with typhoid fever, with no attention except that afforded by Christian Science prayer.

In an apartment house, on the second floor, I found a woman approximately 35 years old, suffering from an unmistakable case of typhoid fever. She was in a state of stupor; lay with mouth wide open; had a pulse of 120 and a temperature of 104 degrees. Was able to be aroused, but was hardly conscious of happenings in the room. A woman friend was taking care of her, chiefly through the aid of prayer. The windows were unscreened and easily four or five hundred flies were crawling around on the bed and nearby utensils. The attending woman claimed that she had been instructed by the health officer as to the proper method of taking care of the sick woman and when I asked if she had any disinfecting solution on hand, or had been using any, she replied that she had not as yet obtained it. It was impossible to instruct this woman, in fact, one could hardly talk to her, because of her great loquacity and her earnest efforts to convert all visitors to the Christian Science faith. She reported that the sick woman was to be baptized that day, which would be the crux of the Christian Science treatment. I told her that if something was not done for the immediate relief of this woman, she would surely die. I gave her instructions about screening the house and the proper care of the patient. I also visited the nearby neighbors, giving them instructions as to screening\* their houses. Also visited the nearby meat market and grocery store. I found the meat market to be very dirty, with a large number of flies crawling over the exposed meat. I explained to the butcher that he was probably lending his aid to further spreading the disease. I then called upon the health officer, but he was out. Later, during a telephone conversation with him, he said that he had been to see this case, but only recently, and had so far failed to report it to this department. This case had been sick about three weeks and was reported to the health officer by Dr. O'Dell, so there is no excuse on the part of Dr. Justice for failing to report the case.

On September 24th, I met Dr. Dunn, who stated that the case had been transferred to his hospital, through the efforts of the woman's brother. At the time she was moved, she was near death, having below normal temperature with very marked pallor and thready pulse. Under proper treatment and nursing, the woman recovered.

## INVESTIGATION OF THE REPORTED SALE OF PORK OBTAINED FROM HOGS SICK WITH CHOLERA

On October 12th, a telephone message was received from Dr. R. A. Ireland, City Health Officer, who stated that there was a report being circulated that pork was on sale in Charleston, which had been obtained from animals dying with hog cholera. I immediately called upon Dr. Ireland and obtained from him such information as he had. He stated that Dr. S. E. Hershey, a veterinarian, had reported to him that F. H. Parsons, on the Sissonville road, had a herd of about 65 hogs which were suffering from cholera, and that Parsons, fearing that they would die, had sold them to Carl Wiersteiner, a butcher.

I asked Dr. O. L. Aultz, the County Health Officer, to go with me to investigate the matter and we proceeded to the home of Mr. Wiersteiner, who lives at Mink Shoals, to hear what he had to say. He denied any knowledge of the matter and further stated that he never had sold hog meat at any time. He is a farmer and occasionally, in the winter, did kill a beef and peddle the meat. His answers were so straight-forward that there could be no doubt of his telling the truth.

We returned to Charleston and after some search found Mr. F. H. Parsons, who said that he had had a herd of hogs 65 in number, which he had been feeding city garbage. These hogs gradually became sick, and after consulting two veterinarians, he decided to sell the animals for anything that he could get. He sold the herd, on September 25th, to Cal Cummings, a farmer living a short distance from Mink Shoals. Mr. Cummings bought this herd knowing that they were sick, but thought that by careful feeding some of the animals could be saved. Mr. Parsons said that three hogs died before Mr. Cummings took them away, and that since then, several hogs had died, but that at no time had any of the dead hogs been sold, nor had any of the sick hogs been butchered, for meat. Later, in our interview with Dr. Hershey, I found that Mr. Cummings was employing him and he said that no animals had been sold for food purposes. The investigation proved that gossip was the origin of the excitement, and that nothing irregular in the way of supplying the citizens of Charleston with pork had been attempted.

## INVESTIGATION OF SCARLET FEVER AT CLENDENIN

In response to a telephone communication received October 22d, 1920, from Dr. I. C. Stump, City Health Officer of Clendenin, I took the afternoon train for that place, arriving there at three o'clock. Dr. Stump met me and told me the following:

A young boy, "E. T." became sick several days ago and a physician was called in. There was some doubt as to the diagnosis of the case, so after consultation with another physician the decision was reached that the case was one of scarlet fever. There are two families in the house and Dr. Ray, a third physician, was called to see a member of the second family. This doctor also visited the first family and gave as his opinion that the case was one of German measles. The father of the boy told Dr. Ray that he should secure the health officer and obtain his opinion.

Dr. Ray asked Dr. Stump to see the case and, in view of the controversy, Dr. Stump called in Dr. Shriver, who stated that, in his opinion, it was neither German measles nor scarlet fever. In order to settle the dispute, Dr. Stump asked for aid from the State Department of Health, and hence my visit.

"E. T", age ten, a school boy, was out riding, Sunday October 16th, with the "J" children in an automobile. He came home complaining of feeling sick; had a sore throat and commenced to vomit. His mother put him to bed and sent for Dr. Golden. Dr. Golden called in Dr. Thaxton and, after looking the case over, they decided it to be one of scarlet fever.

The patient, when visited, had no fever, had a good appetite and was up and running around the house. An examination of the body gave no evidence of either disease, however, on the thighs there was yet the remains of a fine papular rash. The patient's throat was red, the tonsils were swollen and looked exactly like a case of tonsillitis or serious sore throat. In view of the history and the rash, I gave my opinion that it possibly was a very mild case of scarlet fever.

In the "J" family, living in the same house, is a girl about 16 years old, who was, at the time of my visit, quite sick. She had a temperature of 102 degrees, a swollen neck, very sore throat, heavy coated tongue and foul smelling breath. She was not in bed and did not want to go to bed, stating that she was going on an automobile ride. Her mother realized that she was sick, but seemed to have little control over her.

Whether or not this girl was developing a case of scarlet fever was hard to determine. I gave Dr. Stump orders to watch the case and use his judgment as to quarantine.

#### SCARLET FEVER AT THE NORMAL SCHOOL, MONTGOMERY

The Director of this Division was called to Montgomery by Dr. H. C. Skaggs, County Health Officer, to investigate a supposed case of scarlet fever in the Normal School. A report of that visit is given in a copy of a letter written to Dr. Skaggs.

November 15, 1920.

Dr. H. C. Skaggs,  
County Health Officer,  
Montgomery, W. Va.

Dear Doctor:

After having conferred with Dr. J. S. Shaffer, and visiting the patient at the Normal School, I concur in the diagnosis of scarlet fever. The patient and his father are now in two adjoining rooms on the first floor of the building. His father is the janitor and arrangements have been made whereby he will act as nurse to the boy, at the same time giving up all janitor work except attending to the fires. As these rooms are on one side of the hall and well adapted to isolation, it is my opinion that the patient should be kept there, under strict quarantine, and no attempt be made to move him.

The mother is acting as cook for the institution. She promises to uphold the quarantine regulations and not to enter the apartments.

The food for the father and the sick boy will be provided and placed at the door. The father will wait upon the child and will take the dirty dishes to the basement where they will be placed in a dish pan of water and thoroughly boiled. The mother will then take the dishes and further cleanse them for future use. If this arrangement is strictly maintained, I see no reason why the mother should not act as cook for the institution. A placard has been placed upon the door, notifying all teachers and students of the fact that a case of scarlet fever is within.

You, as health officer, are directed to visit this institution daily for the purpose of examining each inmate thereof to see if they show any signs or symptoms of approaching scarlet fever, and if any such are found you will proceed with the cases as best conforms with your judgment. The son of the principal, Professor Martin, has been exposed, having visited the sick boy on Saturday, November 13th. The two older sons of the Judy family have also been exposed and especial attention should be paid to these three young men. As long as they show no temperature or premonitory signs of scarlet fever, they may be allowed to attend school and not be subjected to quarantine regulations. It is my suggestion that you employ a nurse to aid you in these morning inspections. The expense of such nurse being proper charge against the city or county. As the patient was a pupil in the first grade public school, I would further advise that you investigate the public schools, especially the first grade, and ascertain the health conditions therein. For their instruction and information, I am sending a copy of this letter to Dr. J. S. Shaffer and Professor Martin, principal of the Normal School. Hoping that no further cases will develop, I am

Very truly yours,

CARL F. RAVEN,

Collaborating Epidemiologist.

### SMALLPOX EPIDEMIC AT SISTERSVILLE

On November 22d, Mr. L. J. Hamilton, a citizen of Sistersville, becoming alarmed at the increasing number of smallpox cases, wrote a letter to the Governor complaining of the activities of the local health officer and demanding that the State take control. The Governor turned the letter over to this department and an investigation was ordered.

Dr. J. A. Grier, City Health Officer, being called by phone reported substantially as follows:

"There are, at present, in Sistersville eighteen cases of smallpox, mostly among adults. All cases have been quarantined, and are observing quarantine as well as could be expected.

"All of the school children have been vaccinated. No moving pictures, churches or schools have been closed, it being deemed wiser not to do so. The physicians are co-operating with me, but have been slow in reporting their cases. No guards have been placed to enforce quarantine, as, in my opinion, none are necessary."

The disease was of a mild type, no one being sick more than two days. The town authorities were awake to the situation and doing everything possible to control the epidemic. It was the Health Officer's opinion that



no good could come from a personal visit of the State Epidemiologist, and none was made.

On November 29th, reports reached this department that the Sistersville epidemic was getting beyond control. I left for that place at once to make a personal investigation. Sistersville is one of the finest little cities in West Virginia and I found the health officer and the citizens in general willing to do anything to eradicate the plague that was infesting the town. My report of the situation given to the press, at that time, follows:

"After a thorough examination of the situation I find that everything is being done by Dr. J. A. Grier, city health officer, that could be done. As soon as the cases are reported to the health officer he visits the home and placards the house, placing the inmates under quarantine. So far as can be learned, the people are very generally observing the quarantine without the necessity of having guards placed, but the doctor is determined to do everything necessary to stamp out the disease and guards will be placed at the home of any person breaking quarantine. Orders were issued last evening to close the moving picture theatre, pool rooms, churches, and all public gatherings. There will be no prayer meetings held this evening as a result of this order. The Baptist church entertainment which was to be held December 3d has been called off as well as the Elks Memorial service next Sunday evening.

"Seeing that the school children have been vaccinated, the schools will not be closed for the present. If the citizens will co-operate with the health officer it will not be long before the situation will clear up. The reason for the spread of the disease is because of its very mild nature. People with the disease did not feel sick enough to call a physician and did not stay at home and moved about the streets in some instances, broken out with the disease. The health authorities are not to be blamed for this, it happens in all mild epidemics. If the people were real sick with the disease, it would be a great deal easier to handle from the health officer's standpoint. Unnecessary criticism of the health officer is giving the city a bad name which is entirely unwarranted. The only way to eradicate smallpox and keep it away, is by vaccination. The people that are getting smallpox now, are the ones who in the past thought it unnecessary to be vaccinated. With the wholesale vaccination that is being practiced at present the disease will soon be under control.

"My advice to the people of this city is that each and every one should be vaccinated. Properly done, there is no danger. The only danger is from getting the wound infected after vaccination by carelessness on the part of the individual or through carelessness of the surgeon when making the scarification. The danger is not from the smallpox virus but from germs that get into the wound. If you employ a careful physician and are careful yourself afterwards there is no danger at all."

### TYPHOID FEVER INVESTIGATION AT PARKERSBURG

At the request of Dr. H. E. Gaynor, of Parkersburg, I left January 4th to investigate the typhoid fever outbreak in that city.

There were seven cases, six of which were among children ranging from two to eight years of age. The large number of cases among children pointed to a possible milk infection. In company with Dr. W. B. Richardson, City Health Officer, I visited the homes of those sick with the fever, but could find no evidence of contaminated milk supply. Several of the families were using milk from private sources, and no two families were using milk from the same source.

On the following day, in company with Mr. F. R. Knight, Sanitary Inspector, I visited the principal dairies supplying the city with milk, but no trace of typhoid fever could be found on these dairy farms or among the farmers supplying them with milk.

As Parkersburg has for a long time been subject to an infected water supply, it is reasonable to believe that these cases came from the water, but a positive statement as to this cannot be made.

In the evening, I attended a meeting of the Parkersburg Medical Society, and engaged in a general discussion with the physicians as to the purity of the water supply. As a result of that conference, it was decided to hold a public meeting on the following day, to see if the Health Department could not be strengthened by putting in an all-time health officer with a laboratory and the necessary equipment so that daily tests of milk and water might be made. This meeting was well attended and considerable enthusiasm developed.

It was the consensus of opinion of those present that a laboratory should be installed and that a trained laboratory man should be hired to take charge of it.

Committees were appointed to wait upon the City Council to perfect plans for putting in of such a laboratory, which is badly needed.

A later report from Parkersburg states that the laboratory has been installed and a bacteriologist employed.

### INVESTIGATION OF TYPHOID FEVER AT PHILIPPI

For a long time, Barbour County has not been served very efficiently in the matter of local health officers. On January 7th, a report reached this department from a citizen of Marshall County that there were sixteen cases of typhoid fever in Barbour County. Upon examining our records, we could not find any report bearing out this information and the Director of this Division was ordered to proceed to Philippi and make a personal investigation.

Philippi is on the Tygart's Valley river and has been using raw river water for years, with no other treatment than allowing the water to settle in a small reservoir. This reservoir has no particular protection from contamination and is not large enough to hold sufficient water so that the impounded water might become purified through nature's action. The water company has been selling the water for years and advertising that the water is treated for bacteria, which was an absolute misstatement of fact.

Tygart's Valley river serves as a sewer for Elkins and several smaller communities and there is no doubt but that this water is constantly contaminated with sewage and that it is an unsafe water to use for drinking purposes without purification. Examination of the water by the State Hygienic Laboratory, over a long period of time, proves this without doubt. As Elkins and Randolph County had been having a typhoid fever epidemic, it is quite probable that the people of Philippi obtained their typhoid fever by drinking the water from Tygart's Valley river.

Mr. Beckett, one of the State Sanitary Engineers, met me at Philippi and together we installed an emergency chlorinating apparatus to take care of the situation until the water company could install one of their own, which they were ordered to do.

The next day I attended a meeting of the County Court and recommended that they employ Dr. C. B. Williams, as County Health Officer, at a salary of one thousand dollars (\$1,000.00) per year. The Court, after discussing the typhoid fever situation agreed to make this appointment and Dr. Williams was installed in the position with full authority to act.

Had there been an active health officer in charge of Barbour County and had the first cases been reported promptly as they should have been, steps could have been taken a good deal earlier toward correcting the water supply and a large number of these typhoid fever cases might have been prevented.

### INVESTIGATION OF MEASLES AT SHARPLES

Mr. Wylie, general manager of the Boone County Coal Company, requested that a representative of this department visit Sharples and surrounding territory and introduce proper protective measures to eradicate the epidemic of measles then prevailing. Logan county had been having an epidemic of measles during the late fall and early winter months. Sharples, which lies in the extreme eastern part of Logan County, had been free of measles until a family moved in from the infected district, some time in December.

The children of this family had been exposed to measles just prior to moving and soon developed the disease. By mingling freely with the school children, while in the early stages of the disease, the infection was spread broadcast and, as a result, measles became epidemic in Sharples.

At the time of my visit (January 21st) there was little that could be done to stop the disease. All the non-immunes had been exposed and there was nothing to do but let the epidemic burn itself out. Those immune escaped and those susceptible came down with the disease. Certain quarantine regulations were put into force, but after a general sowing of the infection, such regulations have little effect.

### HEALTH OFFICER CONFERENCE

On April 12th and 13th, a conference of health officers was held in Charleston, and the Director had opportunity to discuss with them the subject of quarantine and fumigation. As these questions are of general interest to the citizens of the State, I take the liberty of publishing my remarks upon that occasion.

### QUARANTINE AND FUMIGATION

It used to be thought in former times, that contagious disease was caused by miasms, vapors and poisonous gases arising from stagnant marshes, decaying vegetation, putrid animal matter, and, in fact, from filth of every kind. I think, today, that every person here is willing to acknowledge that contagious disease does not arise from various vapors, but is the result of the action of minute organisms upon the human body, and that this is the only rational theory for contagious disease. While it is true that we have not found the specific germ in every case, still, for a large number of diseases the specific germ has been identified beyond dispute. It thus becomes evident to all thinking persons that if we were able with one sweep of the hand to destroy all of these minute organisms, we would eliminate contagious diseases from the world, and, second, if we are not able to destroy these organisms entirely but were able to keep them apart from the human body, we would still be able to eliminate contagious diseases.

Whenever a disease breaks out in a community and the public becomes aware of its presence, they look to the health officer to stop the further spread of the disease. They are not particularly anxious about the diagnosis, or the cure of the cases already existing, but are concerned with fighting the further spread of the disease and they look to the health officer as the proper person to accomplish this result.

If the sick individual has something in the way of infection which he can give to those who come in contact with him, naturally, at once the idea of separating him from the other people seems to be the proper way to prevent the spread of the disease, and born of this idea is the method of handling epidemics, known as quarantine.

I have no "hard-and-fast" ideas concerning quarantine and will be unable to present to you any rules and regulations which will prove infallible. I propose to discuss the subject and to invite discussion from others present so that we may have a general understanding of what may be done towards eliminating disease by quarantine.

In the first place, we are not justified in putting into operation quarantine to any further extent than the results will warrant. If we were able to prove that strict quarantine would stop disease each and every time, we would be justified in enforcing strict quarantine. This method has been tried innumerable times and under the very best circumstances to bring about success and it has always failed, therefore, we cannot positively say that quarantine will stop disease. Evidently, there is some leak in our mode of attack. This leak seems to lie not so much in the quarantine of known cases as it does in the failure to discover the mild or atypical cases and it is these mild cases walking around freely in the community which really accomplish the further spread of disease.

You might argue from this that quarantine of all known cases is justifiable, for if we allowed every case to go free the disease would be more prevalent than that caused by the escape of the mild cases, and I am inclined to agree with you.

Diseases vary in their nature and intensity and it is difficult to formulate a fixed set of regulations to be used in all cases with equal justice. Health officers who try to follow a fixed set of rules will, in some cases, work hardship upon certain members of the quarantined family. These people, in most instances, will take you to task for the strictness of your regulations. On the other hand, if the health officer tries to use his best judgment in each individual case, quarantining for a short period in mild cases and for a longer period where the disease does not clear up as promptly as it should, he will be subjected to the criticism that he kept in the Jones family only two weeks while the Smith family was kept in six weeks, and no explanation on the part of the health officer can convince the friends of the Smith family that he did not do this simply because he thought it was the proper thing to do, but rather because Jones belonged to the same Lodge or Church or had loaned him ten dollars at some time when he was hard up. This may amuse some of you, but it is the absolute truth as I have often experienced it. The best way for the health officer to avoid criticism is to go absolutely by the fixed, published regulations of the State Department of Health, granting no favors to either friend or foe. This may not be the best way when looked at from a medical standpoint but it is certainly the best way from an administrative standpoint.

Quarantine, to be of any use, should be effective. It does no good to quarantine a case of smallpox and then have the person who has smallpox pay little or no attention to the quarantine, but move around the streets as freely as he did before he was quarantined, and this holds equally true with all other diseases. Most rightthinking citizens will observe carefully the quarantine placed upon them, but there are others who will not do so, and these incorrigibles are the bane of the health officer's existence.

The law gives to county health officers permission to employ guards with which to enforce quarantine. This, of course, means an added expense to the county and many health officers do not feel like adding this expense to the tax payers' burden. I cannot see that it will be effective to place quarantine except in cases where the individual has a proper respect for the law, for if any individual is determined to break quarantine, he will finally accomplish it, even if armed guards are mounted to prevent it. This was proven to me by a case we had at Nitro.

A man fully broken out with smallpox was arrested by the police of Nitro. He lived in a lumber camp a half mile from that city. The case was diagnosed as smallpox and the man placed in the hospital. He resented this treatment, stating that he was not sick and had been at work that very day, and further stated that he would not stay in confinement. They took away his clothes and locked him up, placing before his door an armed guard who walked his beat for eight hours, at which time he was relieved by another guard, who, in turn, was relieved after eight hours duty. Thus providing a continuous guard over this man. These

guards were paid \$125.00 a month. You will be surprised when I tell you that twice during the month, this man escaped from that room, clad only in the blanket from his bed, and succeeded in getting more than a mile away, each time, before being captured.

Now if this can happen, it shows that armed guards are of little service in the enforcement of quarantine, and that our best restriction lies in the willingness of the person quarantined to remain in quarantine until released by the health officer.

Smallpox, being a highly infectious disease and one that spreads rapidly, is best controlled by vaccination, and the more advanced states have ceased to try and control this disease by quarantine and are relying upon vaccination; preaching vaccination; seeing that the school children are vaccinated and making no particular effort to quarantine cases of smallpox. They say, if the people will not protect themselves by vaccination, let them catch the disease, and I am inclined to think that the health officials of those states are justified in their position.

We have a large amount of smallpox in this state and will probably have 5,000 cases this year, and it occurs to me that we will never commence to control this disease until we have a compulsory vaccination law. It is better to prevent this disease by vaccination rather than to try to control it by quarantine. The only time that quarantine actually helps eradicate a disease is where a disease is practically unknown and a new case has just been discovered. At that time, a strict quarantine would be effective.

The State Department of Health has a set of regulations covering the quarantine of communicable disease. Regulation 86 defines quarantine and divides it into two parts—Quarantine and Isolation, quarantine being the stronger term calls for the strict confinement of the sick individual and those attending him, in a room screened against flies and mosquitoes and prohibiting the entrance of all persons except the physician, health officer and other persons especially authorized by the health authorities.

Isolation requires the isolation of the sick person and his attendants in a screened room, but certain members of the family are allowed to enter and leave the premises, provided, that they do not visit places of amusement, worship or education, and keep away from children. A placard should be placed on the house where there is a case of communicable disease. Such placard is an announcement that disease exists on the premises. It is not a disgrace to the family and should carry with it no stigma. It is for the purpose of warning visitors not to enter.

The subject of how long to quarantine naturally comes up, and this is a difficult question to answer. We do not wish to quarantine for any longer time than is necessary but, as I said before, diseases vary in nature and intensity and it is only right and just that quarantine should remain as long as absolutely necessary. For if we remove it early in mild cases and maintain it for a longer time in severe cases, we must submit to criticism, and if we have a fixed average time of quarantine, of course, the mild cases must suffer. Between these two dilemmas the health officer must make his choice.

With DIPHTHERIA, a period of three weeks, where there is no laboratory control, will probably give ample protection. Very rarely will

a throat culture be free of diphtheria germs under two weeks, hence, the three weeks quarantine period for diphtheria.

With SCARLET FEVER, the average quarantine period would seem to be four weeks. The disease is spread from the discharges of the ears, nose and throat and the lesions in these parts should be thoroughly healed before the patient is released from quarantine.

The old idea used to be that infection could be spread from the scales, but I think that the modern teaching is that these scales have no infective power.

MEASLES is another highly contagious disease and one very difficult to control, the period of infection being in the early stages. Quarantine does not seem to help much as the spread of the disease is accomplished before the quarantine is placed.

WHOOPIING COUGH is a contagious disease to which too little attention has been given. To babies under one year of age, this is a most serious disease and, in my opinion, all houses in which whooping cough exists should be placarded, and if the child is taken away from the house there should be a banner on his arm, marked "WHOOPIING COUGH," so that all mothers and others may be warned that the child is suffering from a dangerous disease and is a person to be avoided by small children.

With MUMPS we have no regulation quarantine period, as the disease is usually of such a mild character that no regulation is needed.

And now a few words about FUMIGATION. Of course, fumigation is an effort to kill whatever bacteria there may be scattered around on the floor, furniture or other things and theoretically has for its aim a noble purpose, but, as it is carried out, frequently fails to secure results. An experiment was carried on in New York City by the Health Department; the city was divided as nearly as possible into two parts and on one side of this division line thorough and efficient fumigation was carried on by the Health Department, for a period extending over one year, while on the other side of this line, no attention whatever was paid to terminal fumigation. A careful record was kept during that year of all the incidence of disease and it was found that there was little difference between the two parts. The conclusion was reached that fumigation in no way lessened the number of cases of disease. I think the same experiment was carried on in Providence, Rhode Island, and the health officials feel that fumigation, as now carried on, is of little or no value whatever. The possible exception to this ruling is in cases of tuberculosis. If there has been a case of tuberculosis in any home and the patient has spit promiscuously on the floor or furniture in the house, most certainly such premises should be given a thorough cleansing, and by that I mean that carpets, curtains, etc., should be burned; the floors scrubbed with a strong carbolic acid solution and painted, for only in such manner can the tubercle bacillus be destroyed.

There are two popular methods of fumigation carried on at present: the first is the use of sulphur to form sulphurous acid gas, and the other method, the generation of formaldehyde gas by one means or other. Neither of these methods are of any value if the gases formed are allowed to escape through the open windows, cracks in the doors or other openings. To properly fumigate a room, all cracks should first be care-

fully covered over with strips of paper; all windows tightly closed; all stovepipe openings closed and the room made as airtight as possible. In my experience as health officer, never have I found these precautions put into effect, and not to do a thing properly is a waste of time and money.

In preparing a room for fumigation a certain amount of moisture must be preserved to unite with the gases formed by the burning sulphur or the gas will be inert and fail to do its work. In order that the gas may get at all surfaces, all bedding, towels, etc., should be hung up so that there will be no folds in them. This is another thing that is rarely done. The length of time is another factor to which very little attention is given and the fumigation period is usually too short. Burning sulphur has one objection and that is, it attacks metal surfaces and corrodes them, for this reason after the discovery of formaldehyde gas, the use of sulphur has been abandoned, and almost universally the formaldehyde gas method is used wherever terminal fumigation is deemed necessary.

On the market are several fumigating candles. In order to use them, one simply places the candle in position in a pan of water and lights it, after preparing the room as suggested for sulphur fumigation. Again, to have this method effective there must be a certain percentage of moisture in the air or the gas does not affect the organisms present. The chief value of this method seems to be in allaying the suspicion of property owners and giving them the impression that the health department is doing something to prevent the spread of disease.

As I said before, these methods have been abandoned in communities where considerable thought has been given towards the value of fumigation, with no increase in disease noticed as a consequence. It has been found that if the discharges from the eyes, ears, nose, throat, kidneys and bowels of the patient are properly disinfected at once, and all soiled towels, handkerchiefs and other linen be removed at once from the bed and placed in a strong solution of disinfectant, there is little need of fumigation, in other words, take care of the infection as it comes daily from the patient. After the case is well, a thorough cleaning of the bed, furniture, etc., by means of washing with soap and water will be all the fumigation necessary to employ.

#### FUNERAL DIRECTORS ASSOCIATION MEETING

In May, the Funeral Directors Association held their annual meeting in Huntington and they forwarded an invitation to the State Department of Health to send a representative to Huntington to address their meeting on some subject of mutual interest. As the Legislature had enacted the Model Vital Statistics Law at its last regular session, this invitation gave the director an excellent opportunity, which was duly accepted, to discuss with the undertakers the new law and its several provisions.

Respectfully yours,

CARL F. RAVEN,  
Director Division of Preventable Diseases.



**REPORT OF THE BUREAU OF VENEREAL DISEASES****DR. F. F. FARNSWORTH, Director**

July 1, 1921

Dr. W. T. Henshaw,  
State Health Commissioner,  
Charleston, W. Va.

Dear Sir:

I take pleasure in submitting to you herewith the report of the Bureau of Venereal Diseases for the fiscal year ending June 30, 1921.

Nearly three years ago the State Department of Health of West Virginia started to blaze a new trail in the state. We had no precedents to govern our course, and no map to guide our activities. Under such conditions a perfect organization producing exact results could hardly be expected. Errors were inevitable, and mistakes unavoidable; but the value of the work has not been impaired and the results show an amazing necessity for this branch of preventive medicine.

During the first year of the work the total expense was borne by the Federal Government. The second and third years' work was based on a financial support borne equally by the State and Federal Government. Congressional support has now been withdrawn and we are compelled to face the future with no resources but our own state appropriation, which must of necessity limit our activities and greatly curtail the possibilities of hoped-for results.

However, the work is well organized, but unfortunately, all our old problems remain, while many new ones must be met and solved. Correct statistics of venereal disease prevalence have never been available. In the beginning of the work we were compelled to accept exaggerated guesses or conservative estimates. The one over-shot the truth, while the other fell far short of it.

Three years of investigation has, however, enabled us to harmonize discrepancies, and fix a boundary of fact which is well fortified against any argument that can be produced.

The indifference to personal and public welfare, and the almost universal ignorance of our people of the ravages of venereal disease has, to a very great extent, been overcome and they are being accepted for just what they are—infectious and contagious diseases which are extremely dangerous and should be prevented.

During the first two years of its existence the Bureau concentrated its efforts in spreading broadcast in simple language a description of the venereal diseases, their danger, and the necessity of combating them. This was done by the wholesale distribution of pamphlets, much personal correspondence, and many public talks. I was agreeably surprised at the success of our efforts, but the limit of activities was unfortunately restricted to such a small personnel that only a small part of our 1,400,000 population could be reached. It was plainly demonstrated, however, that the people are quick to respond to this kind of stimulus and the work done would have accomplished all that we hoped for if it could have been increased and continued, but without some

organized follow-up system the interest aroused soon subsides and is forgotten. Realizing this, the Bureau has tried to keep up the interest aroused by establishing *venereal clinics* in some of our largest cities, and lately *venereal centers* in most of our counties. The clinics have only been a partial success due to a lack of money to properly finance them. The county venereal centers are now just beginning to be tried out, but our impotence to finance them is a very tangible ghost of failure.

Venereal diseases, like all other infections and contagious diseases, should be a community responsibility, but in any more or less ideal program the most complete and hearty co-operation of all groups and individuals is essential. Physicians, public officials, leaders in civic and charitable organizations, upward and onward looking men and women in all walks and professions of life must take a personal interest in it.

*Community protection* against syphilis and gonorrhea, and such measures as will insure to children safe and healthful recreation is the first long step in venereal disease control and will solve many problems of our social order. The establishment of county venereal centers is an effort to co-ordinate the medical and follow-up work with work of the same nature in the communities. The only thing needed to make this a success is a competent corps of community or social workers, with whom would rest the difficult task of harmonizing the efforts of the Bureau with local activities. Such workers are scarce and when found, command a salary far beyond our means.

Still, like all problems of civilization, ours is a progressive one and we have done much to justify our existence.

### SUMMARY OF ACTIVITIES

During the past year our activities may be briefly summarized as follows:

Number of cases of venereal disease reported.....	10,276
Number of physicians making these reports.....	895
Number of free clinics controlled by this Bureau.....	7
Number of cases treated in clinics.....	2,146
Number of doses of arsphenamine furnished free by this Bureau,	3,218
Number of cases arrested and examined.....	358
Per cent of those examined found infected.....	63%
Number of cases detained or quarantined.....	148
Number of pamphlets distributed.....	94,065
Number of moving picture showings.....	123
Number of public addresses made.....	88
Estimated attendance at these meetings.....	13,200
Number of legal prosecutions.....	29

Statement showing the actual number of cases reported for the year ending June 30th, 1921, records of which are on file in this office. It will also show the number of each sort of disease reported, together with the marital state, and the number of each sex under 22 years of age as well as the number over 21.

Diseases reported:	Male	Female	Total
Syphilis, .....	2,357	1,269	3,626
Gonorrhea, .....	5,219	1,109	6,328
Chancroid, .....	282	40	322
Marital state:			
Single, .....	5,894	805	6,699
Married, .....	1,964	1,613	3,577
Over 21 years of age.....	6,287	1,012	7,299
Under 21 years of age.....	1,571	1,406	2,977
Total number of cases reported.....	7,858	2,418	10,276

Under the heading of "single" has been included those who have been divorced or widowed.

Under the heading of those under 21 years of age have been included several children reported as having been infected at birth, or have been infected in other ways than what is usually considered the way these diseases are contracted.

It was also noticed in making this classification that the number of cases reported in colored people is in about the direct proportion to their population in the state as compared to the white.

\* \* \* \*

During the past year we have continued to send weekly letters to all physicians in the state and press bulletins to all newspapers. Many others, including Barbers, Dentists, Lawyers, etc. are on our mailing list and have not only received out letters but many circulars of information. The newspapers have been very liberal in printing our bulletins, and hundreds of physicians have expressed an appreciation of our weekly letters. I believe this method of publicity is good, and will continue it.

Besides the seven free clinics being maintained, there are at this time twenty-three counties in which we have established a venereal center with a competent physician in charge, besides a roster of more than sixty other physicians who are treating patients *free* for us or at a minimum fee when called upon to do so by us. The difficulty of getting complete data from all these sources is great, but we *know* that the number of patients actually being treated is much greater than our reports show, and that the number of physicians treating venereal diseases by the most up-to-date methods is constantly increasing.

For the purpose of further qualifying physicians of the state, a Venereal School of Instruction was held in Charleston during the week of April 11th to 16th, 1921, and the following program will show the scope of the work done:

**PROGRAM—VENEREAL SCHOOL OF INSTRUCTION****Bureau of Venereal Diseases****Charleston, W. Va.—April 11-16, 1921***Monday, April 11th—*

- 2 P. M.—Opening address.....Dr. F. F. Farnsworth
- 3 P. M.—Address.....Dr. S. L. Jepson
- 3:30 P. M.—Address, "The Duty of the Municipality in Venereal Disease Control".....Dr. R. A. Ireland
- 4 P. M.—Registration.

*Tuesday, April 11th—*

- 9 A. M.—Dr. Wm. S. Robertson: "Diagnosis and Treatment of Syphilis".
- 9:30 A. M.—Dr. G. G. Irwin: "Cerebro-Spinal Syphilis".
- 10 A. M.—Dr. E. D. Stump: "Syphilis in the Organs of Special Sense".
- 10:30 A. M.—Clinical Demonstrations.
- 2—5 P. M.—Clinical Demonstrations.
- 7 P. M.—Dr. C. E. Gabel: "Wassermann Reactions".
- 8 P. M.—Dr. F. F. Farnsworth: "Salvarsan vs. Neosalvarsan".
- 8:30 P. M.—Paper—Jean T. Dillon, R. N.: "Public Health Nursing and Venereal Disease Control".

*Wednesday, April 13th—*

- 9 A. M.—Dr. F. F. Farnsworth: "Latest in Venereal Disease Treatments".
- 9:45 A. M.—Dr. G. H. Barksdale: "Syphilis as an Imitator of Other Disease".
- 10:30 A. M.—Dr. T. E. Romine: "Syphilis from the Surgeon's Viewpoint".
- Discussion.....Dr. M. V. Godbey
- 11:15 A. M.—Dr. R. D. Roller: "Congenital Syphilis".
- 2—5 P. M.—Clinical Demonstrations.
- 7 P. M.—Laboratory Demonstrations at State Hygienic Laboratory".

*Thursday, April 14th—*

- 9 A. M.—Dr. J. U. Rohr: "Acute Gonorrhea".
- 9:30 A. M.—Dr. Wm. S. Robertson: "Complications of Gonorrhea".
- 10 A. M.—Dr. B. H. Swint: "Gonorrhea in the Female".
- 10:30—12 —Clinical Demonstrations.
- 2—5 P. M.—Clinical Demonstrations.
- 8 P. M.—General Discussion led by Chairman.

*Friday, April 15th—*

- 9 A. M.—Paper by Dr. Joseph A. Porter. Subject to be selected.
- 9:30—12 —General Discussion and Demonstrations.
- 2—5 P. M.—Clinical Demonstrations.
- 8 P. M.—Stereopticon and Moving Picture Exhibitions.

*Saturday, April 16th—*

General Resume.

More than sixty physicians attended this school, most of whom remained the entire week and received certificates of attendance.

### DRUGGISTS

Most of the druggists of the state are giving us valuable help in law observation and enforcement. Nostrums for self-treatment are not now sold in reputable drug stores. There are still some few owners or managers who will sell anything to anybody. It appears to make no difference to them whether it is a venereal disease nostrum or a wood alcohol hair tonic. Three of these men are now under indictment. On the whole, we have found the druggists of the state a high class body of patriotic citizens who are willing to meet the medical profession half way on any legal or ethical question. It is to be hoped that physicians will show their good faith by prescribing instead of dispensing drugs when possible. The new law is very stringent against druggists selling nostrums or prescribing for venereal diseases, and it is the intention of this Bureau to enforce this law as rigidly as possible.

### BARBERS, BAKERS, HOTELS AND RESTAURANTS

In seeking the co-operation of the barbers of the state in the distribution of literature and general dissemination of knowledge, I have been agreeably surprised at the high class of men I have met in that trade. I do not mean to infer that we should expect to find them *inferior* in either intellect or sanitary precautions, but the fact that I have found them *above* the average in learning and as a rule, scrupulously sanitary in their work is a little more than I expected to find. The barbers have helped us much in distributing pamphlets and information.

Hotels and restaurant keepers have never failed us when we sought information or help in suppression of vice. It is true that there are many licensed hotels in the state which are only thinly veiled houses of prostitution, but we do not classify them with the reputable places which are operated by moral, law-abiding citizens.

### LABORATORY TESTS

The amount of work done by the State Hygienic Laboratory in making Wassermann tests, dark field examinations, etc. has been steadily on the increase, the number of examinations made in the past year reaching no less than 4,611.

This work is done *free* in all indigent and public health cases, and only a nominal fee of three dollars is charged for Wassermann tests in legitimate pay cases.

Our best people no longer think it a disgrace to have a blood test made, and knowing the prevalence of syphilis even among innocent victims, take the wise course to further protect themselves by seeking a knowledge of their present condition.

### NEW LAWS

The Legislature of 1921 passed a Venereal Disease Control Law, known as Senate Bill 71. This bill was introduced by Senator York who is himself a prominent physician, and was supported by Senator Godbey, another physician, who was Chairman of the Committee on Medicine and Sanitation in the State Senate.

This new law embodies and writes into the statute all former rules and regulations of the Public Health Council governing venereal disease, as well as the most important points in ordinances adopted by several cities of the state. Reporting and quarantine when necessary, has been a legal obligation of the physician and health officer, and counties and municipalities are required to provide some place of detention when necessary.

Druggists are absolutely forbidden to prescribe or dispense drugs except upon a physician's prescription, and nostrums cannot be sold except in direct violation of the law. This new law while somewhat stringent, is eminently fair to all parties.

Senate Bill 224, introduced by Senator Harmer, in regulating admission to the Girls' Industrial Home at Salem, provides that all girls who might otherwise be committed to the Home, but are found to be infected with a venereal disease, shall first be committed to the Fairmont Hospital No. 3 at Fairmont and there remain until cured or rendered completely non-infectious before being sent to the Girls' Industrial Home at Salem. This wise provision will give authority by which many girls of the state may be saved from lives of prostitution, to the great benefit of society.

### THE PRESS

To the *press* of the state we owe a debt of gratitude that is hard to repay. Almost without exception they have joined with us in our campaign for the control of venereal diseases. Most of them have given space to our Weekly Press Bulletin, and are always willing to print anything of general interest concerning the activities of the Bureau.

Very few newspapers of the state now accept advertisements for nostrums or quack doctors, in fact so far as I know at this time there is no such paper. The editors of the state are to be commended and the State Department of Health congratulated on the broad minded, far-seeing attitude of our press. Probably no other state of the Union is so blessed.

### THE MEDICAL PROFESSION

We have about 1,600 physicians now living in West Virginia, many of them for one reason or another are not in active practice and some do not practice at all. Another considerable number are specialists and do not accept venereal diseases, while a few who are in general practice do not care to treat them. Still our reports show that 895 physicians reported venereal cases during the past year. I believe this justifies me in claiming the almost unanimous support of the physicians of the

state in our efforts to prevent and control. Without this, our work would be doomed to failure. No doubt the physicians of West Virginia are open to many of the criticisms of the medical profession in general, but the charge that they have opposed the activities of this Bureau can never be made. Let us give honor where honor is due.

### APPROPRIATIONS

The Federal Government through congressional failure to make the appropriation has been compelled to withdraw its financial support to the Bureau, and we are compelled to carry on the work on the \$10,000 per year that the State Legislature provided for us for each of the next two years. This will deprive us of more than 50% of our former resources, but will still enable us to continue the work.

When we contemplate the fact that it is now costing the state approximately one-half million dollars annually to care for the insane and feeble minded, and that syphilis at least is a prolific source of these diseased conditions of body and mind, it can be readily seen that our usefulness in such a wide field of prevention is sadly handicaped for lack of funds.

### CONCLUSION

There is every reason to believe that the work of the Bureau is being gratefully received by the people of the state. Communities are constantly demanding speakers for special meetings and literature for distribution far beyond our power to meet.

The object and character of the work has been brought to the attention of the most intelligent and influential class of people of the state—public officials, business men and leading citizens generally.

The attitude of most of our newspapers in printing many articles on social hygiene, sex education and venereal disease has done much to create a public sentiment in favor of the movement.

After all, it is nothing more nor less than a public health question, at least when considered from the standpoint of the State Department of Health, and as such the venereal diseases should be considered and handled from our executive offices in the same way as other dangerous diseases of a like infectious and contagious nature.

The Bureau of Venereal Diseases should be a part of the Preventable Diseases Division, and the diseases themselves cease to be called venereal, but known by their true names, Syphilis, Gonorrhea, and Chancroid, as such reported, controlled, quarantined, or isolated, as the needs may indicate.

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Most respectfully,

F. F. FARNSWORTH,  
P. A. Surgeon, U. S. Public Health Service,  
Director, Bureau of Venereal Diseases.

**ANNUAL REPORT**  
**OF THE**  
**State Health Department**  
**OF**  
**WEST VIRGINIA**

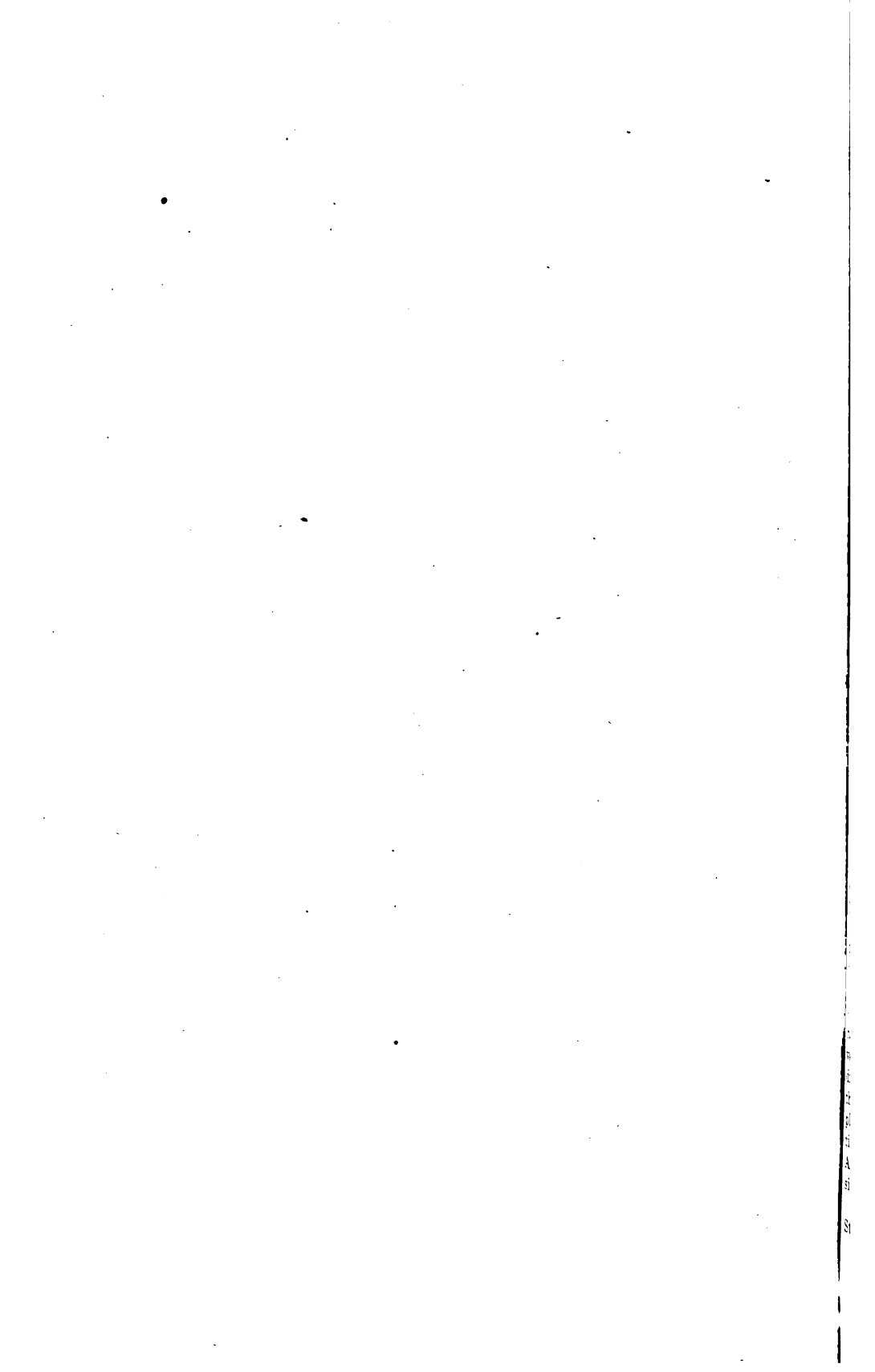
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**JULY 1, 1921—JUNE 30, 1922**



**CHARLESTON**  
**1922**





State of West Virginia  
DEPARTMENT OF HEALTH  
Charleston

December 1, 1922

His Excellency,  
Hon. E. F. Morgan, Governor,  
Charleston, W. Va.

Sir:

I have the honor to transmit my report for the fiscal year ending June 30, 1922.

In the year preceding the appointment of the present incumbent the State Health Department had been in charge of three different executives; each with a different conception of public health work, and each with a different objective which has resulted in much confusion and bringing the work of the Department practically to a standstill. The saving feature was the efficiency of the directors of the different divisions, each of whom was acting independently but doing exceedingly well under adverse circumstances. The attitude of the several directors to the writer was both cordial and co-operative and there was an expressed determination on the part of all to do their utmost to promote health work throughout the State with the means that were available.

#### ACCOMPLISHMENTS OF THE PUBLIC HEALTH COUNCIL

The members of the Public Health Council also were seriously in earnest to advance the cause of public health work and have rendered efficient services at much personal and professional sacrifice. Seven sessions of the Council were held throughout the year—three for the purpose of holding examinations for licensure; three for executive business; and one for a conference of local health officers. The session were well attended and the members of the Council, always faithful and patient, did not permit their private business to interfere with their duty to the people of the State. The pay of \$10.00 per diem allowed each member for attendance was adopted by the legislature several years ago when the purchasing power of the dollar was very much greater than today, and it is urgently recommended that the incoming legislature increase the pay that the members of the Council may be reasonably compensated for the services rendered.

One of the outstanding accomplishments of the Council was the consummation of a contract for supplying biological products at a nominal rate to all the people of the State. By this arrangement both the preventive and curative treatment of a number of infectious diseases; namely, diphtheria, typhoid fever, tetanus, smallpox, etc., is put at the disposal of the very poorest of our population. Depositories for handling these supplies are designated at each county seat and, in addition, every practitioner of medicine can upon application to the manufacturer, Lederle Antitoxin Laboratories, 511 Fifth Ave., New York City, receive a consignment to be paid for as the supply is used.

Ninety-one physicians were issued licenses to practice medicine in this State—thirty-five by examination, and fifty-six by reciprocity—three

chiroprodists were licensed; and seventeen applicants failed to pass the examination. As the minutes of the Council are a part of the permanent record of the Department, and can be secured, it would be both superfluous and unnecessary to print them here. July 15th Mr. Geo. W. Taylor who had been employed as sanitary inspector since November, 1920, voluntarily resigned and the office was discontinued and the duties pertaining to it were transferred to the Division of Sanitary Engineering. Dr. Dwight M. Lewis, director of the Bureau of Rural Sanitation, resigned September 25th and the Bureau was merged with the Division of Preventable Diseases.

### WEST VIRGINIA'S MODEL VITAL STATISTICS LAW

The legislature of 1921 passed the Model Vital Statistics Law, West Virginia being the forty-fourth state to adopt this progressive measure for the purpose of keeping a permanent and accurate record of the number of the births, deaths and marriages. The law became effective July 20th and Dr. Carl F. Raver was transferred from the directorship of the Division of Preventable Diseases to the Division of Vital Statistics created by the legislature. Dr. Raver had been very active in securing the passage of the Vital Statistics Act, he had worked diligently a number of years for its success and possesses a thorough knowledge of all its details. Since he has been in charge, he has labored industriously and vigorously to achieve the purposes of the law and although he has made remarkable and surprising progress, West Virginia still remains outside the registration area of the United States. Dr. Raver's request for a field supervisor is well timed, and the Commissioner recommends that the request be complied with and an appropriation sufficient to carry on the duties of the office be made. The law itself needs a strengthening clause in fixing heavier penalties for failure on the part of the physicians, mid-wives and undertakers to make reports. There has been a marked failure on the part of some professional men to co-operate with the director and their negligence has been dealt with patiently and leniently. No reasonable objection has been launched against the provisions of the law and it is the hope of this department that when the provisions of this law become fully operative in all parts of the state the citizens will fully appreciate its worth.

### ENGINEERING DIVISION'S NEEDS

Reference to the report of the Engineering Division will readily show the almost incredible amount of work performed by the staff. The Division ranks well with the engineering activities of any state of its size and population. The Division is composed of engineers with a good technical training together with practical field experience, but its personnel is entirely too small to meet the demands that come from every quarter of the State. At least two additional engineers should be added to the force and branch offices established—one in the Northern and one in the Southern section of the State. Such an arrangement would result in the Division being enabled to cover more territory, respond promptly to emergencies, and greatly reduce the expenses incident to travel.

## STATE AND FEDERAL GOVERNMENTS' CHILD HYGIENE PROGRAM

Recognizing the need for better protection of the health of the children of the State, the legislature in its session of 1917, added the Division of Child Welfare and Health Education to this Department, to which division the Public Health Council has added the branch of Public Health Nursing. Both are imperative if fundamental progress is to be expected from public health activities. The principal work of the division is carried on in the public schools of the State and under representative community and county organizations for public health nursing service. The progress reported has been very gratifying. The division is constantly enlarging its activities and must augment its office and field force if the program it has outlined is to be fulfilled.

Under this division falls the administration of Maternal and Child Hygiene work created by an Act of Congress known as the Sheppard-Towner Act. A Federal appropriation has been made available for West Virginia with the provision that a like sum be provided by the State legislature. The original draft of the bill met pronounced opposition, not only from the medical profession but also from a group of the laity. The objectional features, and some were almost vicious in character, were ultimately eliminated and the bill as passed contains many excellent provisions to safeguard the health and life of the expectant mother and the new-born baby. Approximately 2,500 babies die in West Virginia annually under the age of one month; nearly 4,000 under one year, and 300 mothers lose their lives each year from accidents incident to childbirth. These figures are appalling but are the facts. Many of the deaths are wholly preventable but little effort has been made heretofore to instruct the expectant mother in the proper care of herself or the management of the new-born child. The health program as applied to Maternity and Infancy is deplorable and can only be corrected by the intelligent application of hygienic measures by trained workers in this particular field. The division asks for an appropriation of \$5,000.00 to match the sum of \$10,000.0 from the Federal Government and there should be no hesitation in approving the request.

## GROWTH OF STATE HYGIENIC LABORATORY CONSTANT

In 1917 the Public Health Council effected the removal of the Hygienic Laboratory from Morgantown to Charleston. The decision to make the change was brought about by a desire to have all the divisions under the immediate personal supervision of the Health Commissioner. It did not appear to the Council that the laboratory was rendering the general service that should be expected since it was thought the director had a divided responsibility between the work incident to the laboratory and his duties in connection with the medical department of the University. Furthermore, Morgantown is inaccessible to the majority of physicians and the general public who have need of laboratory service. Before the removal, the work of the laboratory consisted mainly in examination of diphtheria cultures and specimens for tuberculosis, typhoid fever, and drinking water. Since the change not only have the exami-

nations of the foregoing specimens greatly multiplied but additional work has been performed; namely, the examination of blood, pus, smears, etc., to aid in the diagnosis of venereal infections. Also there has been added complete facilities to determine the presence of Rabies in animals, and these facilities have been made constant use of. The laboratory is in need of equipment which should be purchased immediately in order to continue to render efficient service.

### VENEREAL DISEASE CONTROL—A SPECIAL PROBLEM

The prevention and control of venereal infection has been one of the most difficult problems confronting any health organization. These diseases have been the last to be made reportable. Repeated efforts on the part of various members of State Boards of Health to require physicians to report venereal infections have ended in negative results, and it was not until the World War was well begun and the Federal authorities became exceedingly active in effecting repressive measures to limit prostitution in the cantonment zones that substantial progress was made in securing the passage of regulations by State Boards of Health to require the notification of venereal diseases. The legislatures of many states promptly united in the passage of such laws as would completely eradicate open prostitution, and health officers were clothed with complete authority to effectively limit and control venereal diseases.

The Bureau of Venereal Diseases of this Department was created by the Public Health Council in July, 1918, Dr. F. F. Farnsworth, then President of the Council, was placed immediately in charge and continued to serve until May 1st of this year when he voluntarily resigned on account of ill health. He was succeeded by Dr. W. S. Robertson as the acting head until a successor who could give his full time to the work could be found. The legislature of 1921 passed the Venereal Disease Act (Chap. 137) which is probably as complete as any law ever enacted for the repression of vice and the diseases incident thereto. The law provides the additional safeguard of confining diseased prostitutes, both male and female, in places of detention until they are no longer infectious. They may then be released under bond with the agreement to continue treatment until cured. Theoretically, the law is ample but under the part time system of employing health officers it is not effective for two reasons: First, the failure of many physicians to report their cases; second, the indifference or inactivity of the health officer or his positive refusal to enforce the provisions of the statute. Where the provisions of the law have been enforced under the whole time health system, notably in Wheeling, the results have been exceedingly gratifying. Wheeling stands out conspicuously as the one point in the State where the control and prevention of venereal disease is making substantial progress. Such progress can be made in any community when the health officer is a man of courage, fairness and determination such as the present health officer of the city of Wheeling.

One of the outstanding health problems of the State that vitually affects all classes, ages and sexes is the control of venereal disease. Syphilis is the cause of insanity of 20% of the population in our insane institutions. To this figure may be added at least 15% of permanent

physical disabilities due to the same disease. 75% of the major surgical operations upon the organs of the female pelvis, to say nothing of the blindness of new-born babies, are due to venereal infection. In their totality the figures are astounding. If these infections were incurred only among those of large means or at least prosperous enough to pay the expenses incident to treatment, a marked reduction in the number of permanently disabled might be expected, but venereal disease, as is true of other diseases, is no respecter of persons. When they overtake the poor, the indigent and the delinquent, the victim becomes a hopeless charge upon society and the State. The curative treatment is to expensive to be undertaken by the patient and medical care is not extended to this class of subjects by the members of the medical profession. For the purpose of ameliorating the situation in the state it is urged that a larger appropriation for the purpose of organizing and supporting clinics in a number of centers be made available by the legislature.

### DIVISION OF PREVENTABLE DISEASES

The transfer of Dr. Raver to the division of Vital Statistics created a vacancy in the directorship of the Division of Preventable Diseases. The duties of the office had to be assumed by the Health Commissioner who continued to discharge them until November 15th. At that time Dr. M. V. Ziegler was detailed by the Surgeon General of the United States Public Health Service to the Department for the special purpose of creating public opinion for full time health organizations. As an aid to the fulfillment of his mission Dr. Ziegler assumed the directorship of the Division of Preventable Diseases. By the direct, thorough and scientific manner in which he has investigated a number of epidemics of infectious diseases and the simple and effective measures he has instituted for their control he has attracted the attention of substantial and thinking people in the respective communities. These investigations invariably have shown the prime necessity of having a trained whole time health officer in charge of public health affairs. There is every reasonable assurance that several counties will adopt his recommendations with this end in view at the beginning of the next fiscal year. Marked difficulty has always attended the administration of this Division on account of the failure of some and the refusal of other physicians to report their cases of communicable diseases as required by law. A number of practitioners have never made a single report. This condition is true not only in West Virginia but wherever the health officer is employed on a part time basis. The number of county health officers who report regularly is small. Both the statutory law and the regulations of the Public Health Council require health officers to report weekly. How poorly the law and regulations have been complied with is revealed by the following tables:

COUNTIES	Number of Weekly Reports During the Year
Barbour, Grant, Nicholas .....	52
Kanawha, Mason, Ritchie .....	51
Berkeley, Brooke, Lewis, Pendleton .....	50
Mineral .....	49
Hampshire, Marion, Webster .....	48
Monongalia, Monroe, Preston .....	47
Hancock, McDowell .....	46
Doddridge, Jefferson .....	45
Harrison, Putnam, Raleigh .....	44
Braxton, Hardy, Mingo .....	43
Fayette, Tucker .....	42
Wood .....	41
Logan, Marshall, Mercer, Summers .....	40
Lincoln, Wirt .....	39
Roane .....	38
Greenbrier .....	37
Randolph .....	36
Jackson .....	35
Cabell, Clay .....	34
Taylor .....	33
Ohio, Wyoming .....	25
Morgan .....	24
Gilmer .....	22
Upshur .....	19
Wayne .....	18
Tyler .....	14
Boone .....	8
Pleasants .....	5
Wetzel .....	4
Pocahontas .....	3
Calhoun .....	2

You will observe that three counties have a perfect score, although the counties of Mingo and Ohio have not failed to send a weekly report since they have been on a full time basis.

#### COMPLETE REPORTING FUNDAMENTAL FOR CONTROL MEASURES

It is a well known fact that in order to establish control of preventable diseases it is necessary to know where, when and under what conditions cases of sickness are occurring. If the health officer is to function at all it is essential that he be supplied with this information and one can easily appreciate the handicap to efficient public health administration when cases of infectious diseases are not reported. The accuracy and reliability of the total of the number of official reports concerning the prevalence of communicable diseases in the counties from

which the reports were received can readily be questioned. Investigations of a number of outbreaks by the director, have invariably established a far greater number of cases of the disease than were actually reported. Most of the reports are so meager as to be positively untrustworthy. The following cases illustrate this point: One county reports a single case of typhoid fever, when it was definitely established that over a dozen cases of this disease existed in a single section of this county; and another county reported seven when there was authentic information that an epidemic prevailed in a small area of that county.

### WEST VIRGINIA'S TUBERCULOSIS PROBLEM

The report of the total number of cases of tuberculosis in the State is absurd, being but 584. A large number of counties do not report at all and yet are continually sending patients to the state sanitarium at Terra Alta for treatment, with a waiting list at home. From the mortality reports of this disease that have been received, and the surveys that have been made during the year it can reasonably be said that at least 1% of our total population is infected with tuberculosis. The funds necessary to institute preventive measures to limit the spread of this disease are not available from Governmental sources. The only Agency pretending to do anything in this field of public health work is an extra-governmental one without any authority and the money essential to the conduct of their surveys and investigations is derived from voluntary contributions. It is urgently requested and hoped that the legislature will make available a fund sufficient for this Department to undertake the absolutely necessary educational work that is required to inform the people upon the nature of the disease and the means for its prevention.

### MEDICAL SERVICE AND PUBLIC HEALTH IN RURAL AREAS INADEQUATE

The inadequate medical service that prevails in the rural sections of West Virginia is a matter of grave concern. Immense areas, reasonably well populated are absolutely without medical service. It is no unusual thing to have but one physician for every hundred square miles of territory. The State has an abundant supply of doctors, but they are centered chiefly in the cities, consequently the rural population is without professional protection. In view of this it is essential that every effort be put forth to instruct the entire population in the method of preventing those disease which are preventable.

The effectiveness of state public health programs lies in the local application of public health measures. Over fifty years ago Massachusetts organized the first State Board of Health. There were no trained health workers at the time and any physician was thought eligible to fill the position as health officer. The members of the health organization were practitioners who gave such time as they elected from their private practice to the promotion of public health. Unfortunately, this same antiquated, incompetent and dangerous situation is followed in many sections of our State today. Occasionally some conscientious part



time health officer, at uncalled for personal and professional sacrifice, is a forcible demonstration of the possibilities of public health work in achieving a single objective. However, the activities of the health officer consist mainly in enforcing quarantine against cases of communicable diseases, still other local representatives of this department have no conception of health activities at all or else fail or refuse to apply their knowledge. The result is that only a small proportion of our population have the least conception of the meaning of the term "public health."

#### **PUBLIC HEALTH OBJECTIVES—WHOLE TIME HEALTH UNITS**

The principal objective of every health department is the control and prevention of diseases. This includes not only diseases caused by contact, by polluted foods and water, by insects and parasites, but also the constitutional diseases and those particularly incident to pre-school and school ages. It is within the province of the health department to correct the malformation and disabilities of the child when they are correctable; to apply treatment for those affected with diseases that annually add to the population of our insane, penal and eleemosynary institutions—in short, to develop our human power, to conserve the health and prolong the lives of all. The health department wishes that not only every child should have the inalienable right to be well born, but before its birth the mother should have intelligent care that will safeguard and protect her in her travail, that she should be shown simply and clearly the ordinary rules of hygiene that will save the baby to the family and to the State. The time is present when the people should understand that the medical profession is no more the safeguard of public health than the legal profession is the safeguard of property. The members of both professions, although ever so able, have their limitations. Physicians should be always ready and willing to give expert professional opinion but the services should be properly paid for from governmental sources. Public health is as much of a specialty as Surgery, Gynecology, diseases of the Eye and Ear, and the other branches of medicine. To be competent in this field requires as much training and practice, and certainly even greater capacity for service than any of the specialties. The question naturally arises, "What is the solution?" Primarily, there is but one answer—the whole time efficient health unit. A minimum personnel of such a health organization should consist of a health officer and clerical assistance, an office properly equipped, one or more registered public health nurses. Provision should be made for transportation. As the work progresses the services of a sanitary inspector and bacteriologist will be needed and the staff can be increased. The cost incident to the expenses of the minimum requirements is about \$10,300. This sum is no larger and probably not as large as the cost of the present part time system, plus the funds raised by subscriptions for various health activities. These unorganized health agencies usually carry on in a haphazard fashion which is productive of little more than a misconception of true public health work.

### LEGISLATIVE ACTION ON FULL TIME HEALTH WORK

The legislature of 1919 empowered county courts to fix a levy not to exceed three cents on the hundred dollars assessed valuation for the purpose of organizing and supporting full health departments. At least twenty-five counties in West Virginia could not support such departments on their own resources. For this purpose, a co-operative fund should be appropriated by the legislature to enable these counties to have the benefit of an efficient health administration. In view of the fact that is the custom of the United States Public Health Service to limit the assignment of one of its members to a state for a period not exceeding two years, it will also be necessary for the legislature to make ample provision to pay the salary and expenses of a director for the Division of Preventable Diseases.

### WEST VIRGINIA'S PROGRESS UNDER FULL TIME WORK ENCOURAGING

Health officers should be selected on account of their fitness, both technical and practical and the work of their departments removed entirely from the field of politics. No sensible or conscientious citizen would employ a physician for his family or himself on account of the physician's political affiliations or activities. For like reason, this most responsible position of safeguarding the lives and health of the people requires the highest scientific and professional qualifications and should be completely removed from the field of political endeavor. Wherever public health has been efficiently administered the results have been extremely gratifying and the expenditure yielded large dividends. The public itself demands better public health work. As witnesses in our own State let me cite Mingo county as a splendid example of an efficient health unit. The cities of Wheeling and Clarksburg are well in the fore-front of any cities in West Virginia in public health progress. Health work is to a large extent educational. Its progress it marked chiefly through contact. Circular, press literature, bulletins, and the distribution of general information through such channels do much to prepare the public mind for the reception of the truth of sanitation, but it is the living voice of the health officer as a teacher that drives home the truths of sanitary measures, and the economy of disease prevention.

Respectfully submitted,

W. T. HENSHAW,  
State Health Commissioner.

## REPORT OF BUREAU OF VENEREAL DISEASES

Charleston, W. Va., Oct. 31st, 1922.

Dr. W. T. Henshaw,  
Commissioner of Health,  
Charleston, W. Va.

Dear Sir:

Pursuant to your request, there is herewith submitted a report of the activities of the Bureau of Venereal Diseases for the fiscal year ending June 30th, 1922; also a tentative budget of expenses for the ensuing two years. You will note that the expenses as estimated are much in excess of funds that have hitherto been available but it is felt that if the most is to be accomplished in the campaign against venereal diseases, it will be necessary to have an appropriation equal to the amounts submitted.

Request has been made to the Surgeon General for comparative figures of appropriations for venereal disease control work by the various State Legislatures, which information will be given you as soon as it is received.

Very truly yours,

WILLIAM S. ROBERTSON,

A. A. Surgeon, U. S. P. H. S.

WSR/W      Director, Bureau Venereal Diseases State Dept. of Health.

The Bureau of Venereal Diseases of the State Department of Health of West Virginia submits the following report of activities for the fiscal year ending June 30th, 1922:

Number of cases reported (by physicians, hospitals, clinicians, etc.)			
	Male	Female	Total
Syphilis .....	2,739	1,212	3,951
Gonorrhea .....	3,244	654	3,898
Chancroid .....	229	58	287
Number of ampules of Neoarsphenamine sent to physicians to be administered free of charge in charity cases .....			3,604
Number of doses of arsphenamine (or similar product) reported administered in clinics .....			3,370
Clinic report of laboratory examinations made:			
Total number of Wassermann tests .....			972
Total No. microscopic examinations for treponema pallidum .....			92
Total No. microscopic examinations for the gonococcus .....			261
State Laboratory report of Venereal Disease Examinations:			
Total number of Wassermann tests .....			3,678
Total No. microscopic examinations for treponema pallidum .....			79
Total No. of microscopic examinations for the gonococcus .....			590
Number of cases of venereal disease placed in detention:			
Male .....			8

Female .....	12
Number of cases of venereal disease hospitalized:	
Male .....	6
Female .....	11
Number of requests for pamphlets received .....	736
Number of pamphlets distributed in response to above requests	4,500
Number of pamphlets distributed by circularizing mailing lists	2,200
Number of pamphlets distributed to clinics, lecturers, field workers .....	1,200
Number of pamphlets purchased (W. Va. Laws) .....	10,000
Number of lectures and addresses given .... 21	Total attendance 3,200
Number of slide showings made ..... 8	Total attendance 350
Number of film showings made ..... 58	Total attendance 5,250
Number of visits to cities during the year .....	15

WILLIAM S. ROBERTSON,  
A. A. Surgeon, U. S. P. H. S.

Charleston, W. Va., Oct. 31st, 1922.

Dr. W. T. Henshaw,  
Commissioner of Health,  
Charleston, W. Va.

My Dear Dr. Henshaw:

I have the honor to submit herewith report of the Bureau of Venereal Diseases of the State Board of Health of West Virginia for the fiscal year ending June 30th, 1922.

This report of the activities of the Bureau of Venereal Diseases for the year 1922 must be a forecast rather than a history, a prediction rather than a summary of accomplishments. There are several reasons for this: Dr. F. F. Farnsworth, Director of the Bureau from the time of its establishment, was ill for several months last winter, his health finally inducing his resignation. This Bureau for a few months was without a worker on its staff and became practically inoperative. During this period many constructive features of the program became disorganized and many valuable contacts weakened or lost. Besides, the Bureau was handicapped by a reduction of fifty percent in its appropriation, the Federal fund having been withdrawn.

Dr. W. S. Robertson is now acting Director and Miss P. C. Shields is Associate Director of the Bureau of Venereal Diseases. A state-wide campaign for the control of venereal diseases has been definitely planned, and has already begun to function. This contemplated program takes recognition of the fact that the venereal diseases are so prevalent, so insidious in their attack, and so indirect in their methods of maiming and killing that the public is still without an organized defense against them; that the continuance of this state of unpreparedness is favored by the complicated relations of the medical, moral, and social aspects of their eradication; and that for the present, it is desirable to consider the venereal diseases as a preventive medicine problem.

It is conceded that the cause of these diseases is known; that human carriers afford their chief mode of dissemination; that in prevalence and

injury to the people they are not outranked by any others of the communicable disease group; and that we should apply these facts exactly as we apply similar facts concerning other preventable diseases. This means that in the control of the venereal diseases there must be adopted and enforced three distinct but correlated plans, composing the state campaign program. The practical attack on venereal diseases briefly summarized is as follows:

1. Medical measures for the discovery, treatment, and control of individuals already infected: to be largely carried out by cooperating with clinics, hospitals, and private practitioners.
2. Repressive measures for the elimination of conditions of environment favoring the dissemination of infection: to be carried out by cooperation with municipal authorities, police officials, sheriffs, judges, prosecuting attorneys, representative citizens, and civic organizations.
3. Educational measures for the protection of individuals not yet infected: to be carried out by cooperation with moral and social agencies, teachers, parents, and nurses.

In all the diverse activities of these three major lines of conducting this health conservation, there stands out prominently the need for enlisting all the forces of the community for a long period of years to make any permanent gains; and that the great difficulty in the application of these three measures is that they cannot be developed more rapidly than the formation of public opinion upon the importance of eradicating the venereal diseases.

However, with a full sense of the many obstacles to be overcome and a keen appreciation of the responsibility the task imposes, the Bureau of Venereal Diseases has outlined in some detail the main features of its three-fold venereal disease control program as follows:

#### 1. MEDICAL MEASURES.

1. Establishment of free venereal disease clinics for indigents.
2. Free laboratory examinations for syphilis and gonorrhea of indigent patients of physicians and of public clinics.
3. Provides Neosalvarsan to public venereal disease clinics of the state and also to physicians treating indigent cases of the venereal diseases.
4. Periodic inspection of venereal disease clinics to keep in touch with the work being done; to determine what assistance may be needed; to encourage the treatment of men as well as women; to suggest night treatment as well as day hours; to secure proper places for quarantine; and to urge the engaging of social workers to do follow-up and after-care work.
5. Securing more adequate provision for venereal disease treatment in general hospitals.
6. Stimulate the reporting of venereal disease cases by physicians and of compiling statistical information from same.

7. Circularizing physicians of the state with letters of information concerning advances in treatment of venereal diseases, and also with pamphlets and other literature.
8. Elimination of the advertising quack.
9. Prevention of the sale of venereal disease nostrums.
10. Control of venereal diseases in penal population of the state.

## 2. REPRESSIVE MEASURES.

1. Effort to secure needed laws in venereal disease control.
1. Stimulate state-wide enforcement of venereal disease control and antiprostitution laws.
3. Repression of prostitution.
4. Commissioning State Police as health officers in the enforcement of venereal disease control laws.
5. Secure institutional care for feeble minded.
6. Adequate institutional provision for vocational training and rehabilitation of delinquents.
7. Promote establishment of juvenile and women's courts.
8. Encourage the employment of police women, probation officers and travelers' aids.
9. Regulation of taxi cab and for-hire automobiles.
10. Inspection of hotels, restaurants, etc.
11. Investigation and report to proper authorities of vice conditions.
12. Supervision of public places of amusement.
13. Stimulate interest of industrial organizations in venereal disease control.
14. Censorship of plays and pictures for young people.
15. Promotion of athletics, outdoor sports, community centers, etc.

## 3. EDUCATIONAL MEASURES.

1. Distribution of pamphlets and other literature on venereal disease control.
2. Circularization of books.
3. Posting of placards.
4. Motion picture showings.
5. Exhibits.
6. Lectures:
  - (a) Women's clubs.
  - (b) Normal and high schools.
  - (c) Men's organizations.
7. Newspaper publicity.
8. Conferences with city and health officials, police officers, etc.
9. Organization of venereal disease study groups.
10. Organization of social hygiene societies.

In addition to the activities as outlined above, the Bureau of Venereal Diseases is planning a Venereal Disease Institute and model clinic for the physicians of the State. With the cooperation of the U. S. Public Health Service it expects to conduct a Social Hygiene Conference for

laywomen. The aim of the conference is to educate non-professional women to understand more clearly the problems of social hygiene in order that they may be better fitted to work for the improvement of social, moral, and health conditions in this state. It is expected that speakers of national repute will be on the program.

For the first time venereal disease control is being undertaken directly with the colored people of the state by a member of their own race, Mrs. Grace Crump having been engaged for the work as a field agent of the Bureau of Venereal Diseases. Mrs. Crump is a graduate nurse and has just completed a course of intensive social training in Baltimore. She will carry out the various provisions of the venereal disease control program in the colored communities. Through the cooperation of the U. S. Public Health Service a colored physician, Dr. Brown, is being loaned to the Bureau of Venereal Diseases to undertake educational activities among colored groups.

Although the cases of venereal disease reported to this Bureau have been incomplete, they nevertheless are of sufficient number to indicate the prevalence of these diseases throughout West Virginia. The annual toll in loss of life: the amount of money expended in treatment: the economic loss measured in terms of time and lowered efficiency: the burden of taxation necessary to support eleemosynary institutions crowded to the doors with venereal disease victims: not to mention the mental suffering and unhappiness caused by these diseases, are of sufficient magnitude to arouse the interest and support of every intelligent individual. If success can be attained in the gradual eradication of syphilis and gonorrhea—the last among the great plagues of world wide prevalence which afflict mankind unchallenged—the cost, however great in money, in educational effort, and regulation of personal conduct, will be immeasurably exceeded by the gains. Public health administrators, hospital directors, clinicians, and private citizens, by giving cooperation to the work of the Bureau of Venereal Diseases, have the opportunity of rendering the greatest health service to the State of West Virginia.

Respectfully submitted,

PERMELIA C. SHIELDS,

Associate Director, Bureau of Venereal Diseases,  
State Department of Health,  
U. S. Public Health Service.

## RECOMMENDATIONS FOR LEGISLATION

### Bureau of Venereal Diseases

### State Department of Health

1. It is recommended that adequate appropriation be made to the State Board of Health to enable it to carry on a broad venereal disease program in this State.
2. It is recommended that Senate Bill No. 224 (1921) amending the provisions of Chapter 45 of the Code concerning the admission of girls to the Industrial Home at Salem be modified so as to admit girls infected

with syphilis or gonorrhea and unmarried mothers directly to the Salem Institution and to further provide that all appropriations formerly made to Fairmont Hospital No. 3 for the medical care of venereally infected girl delinquents be transferred to the Industrial Home at Salem.

3. It is recommended that an Injunction and Abatement Bill be introduced in the Legislature.

4. It is recommended that a bill making the venereal diseases a bar to marriage be introduced in the Legislature.

5. It is recommended that a bill making it a crime to transport a person for purposes of prostitution (within the State) be introduced in the Legislature.

6. It is recommended that a bill providing for the microscopic examination of all persons admitted to the eleemosynary institutions of the State be introduced in the Legislature.

7. It is recommended that a bill requiring that prisoners infected with venereal diseases be restrained beyond the term of commitment for the purpose of treatment be introduced in the Legislature.

8. It is recommended that a bill penalizing the use of a place or conveyance for purposes of prostitution be introduced in the Legislature.

The above recommendations for legislation are merely tentative and are to be submitted to the office of the Attorney General for reconsideration and revision. The recommendations listed below are considered of secondary importance and are stated simply to indicate further social hygiene legislative needs of the State.

9. Keeping a disorderly house and being an inmate are made an offense but the other features of Standard Form No. 1 are lacking and are recommended for enactment.

10. A bill penalizing the activities of go-betweens in prostitution.

11. A bill making it a crime to solicit for purposes of prostitution.

12. A bill making it a crime to give or receive the body for prostitution, with or without hire.

13. A bill making it a crime to engage in prostitution.

14. A bill amending Chapter 94 of the Laws of 1919 to include municipal officers in the provision for judicial removal of officials.

15. A bill raising the age of consent to 18 years.

PERMELIA C. SHIELDS,  
Associate Director Bureau Venereal Diseases,  
State Department of Health.



**FOURTH ANNUAL REPORT**  
**Division of Child Hygiene and Public Health Nursing**  
**WEST VIRGINIA STATE DEPARTMENT OF HEALTH**  
**1921-1922**

Dr. W. T. Henshaw,  
 Commissioner State Department of Health,  
 Charleston, W. Va.

Dear Sir:

I have the honor to submit the following report concerning the activities of the Division of Child Hygiene and Public Health Nursing from July 1st 1921 to June 30th 1922.

**Personnel**

The Staff of the Division consisted of the Director and one Field Supervisor, with one clerical worker, for the first three months of the year. An additional field worker was added at this time for the remainder of the year. In May the finances formerly provided by the Red Cross for one field supervisor, were withdrawn but the money available from the Sheppard-Towner Fund made it possible for us to adjust matters without depleting our staff.

**Field Workers**

There are now eighty-seven public health nurses in West Virginia, twenty-three of whom have been added during the fiscal year. These nurses are employed and financed by various organizations, or groups of organizations, as follows:

Financed by State Department of Health .....	3
Financed by Washington Division American Red Cross .....	1
Financed by State Tuberculosis Association .....	1
Financed by Boards of Education .....	21
Financed by Industrial Organizations .....	19
Financed by Representative Community Organizations .....	8
Financed entirely by Red Cross Chapters .....	6
Financed by Women's Clubs .....	6
Financed entirely by County funds .....	6
Financed by Red Cross and Boards of Education .....	5
Financed by local Tuberculosis League .....	4
Financed by local Tuberculosis Leagues and Red Cross .....	3
Financed by Metropolitan Life Insurance Company .....	2
Financed by County Funds and Red Cross .....	1
Financed by Associated Charities .....	1

Eighteen of these nurses are covering county-wide territory; five are covering an entire school district and fifty-nine are employed within the confines of a city or community.

### Division Staff Activities

The members of the Public Health Nursing Division Staff have gone out into the State to work with local nurses to assist them with their plans and problems, many times receiving from them quite as much as we gave, which we in turn can pass on to other nurses in the field. We have assisted clubs in making their health programs, have made demonstrations in school health work, assisted communities and counties in organizing for their health work, addressed various groups, upon request, concerning health problems and plans, have assisted in conducting child health conferences and have responded to every call on our time and resources in so far as personnel and finances would permit. The following places have been visited once or oftener for these various purposes:

Buffalo	Iroquois	Fayette
Beckley	McMechen	Parkersburg
Williamson	Glendale	Flemington
Institute	Hamlin	Summersville
Bluefield	Affinity	Chester
Spencer	Welch	Morgantown
Wyco	St. Albans	Clarksburg
Cameron	Princeton	Keyser
Lewisburg	Pt. Pleasant	New Martinsville
Benwood	Devil's Fork	Follansbee
Marlinton	Moundsville	Sheppardstown
Huntington	White Sulphur	Grafton
Handley	Elkins	Glenville
Gary	Wellsburg	Hinton
Logan	Charles Town	Weston
North Fork	Fairmont	
Wheeling	Buckhannon	

Some of the more important service in our field work was as follows:

### Monongalia County

In July the Director made a visit to Morgantown to address the social service students in the summer school at the State University on "The Public Health Nurse and Her Work," and on "The State Department of Health," its organization and function. She also spoke at this time to the teachers of Monongalia County at an institute meeting on "Making the Study of Hygiene Practical and Attractive."

In January a representative attended the annual West Virginia Farm Bureau Meeting to assist in outlining the health program of the Farm Women's Clubs.

### Gilmer County

In August a talk was given to the public school teachers at the County Institute in Glenville on "Physical Defects of School Children"—their results and the necessity for their prevention and correction. A meeting was held at this time with the executive committee of Red Cross and rep-

representative county officials to discuss the financial problem involved in the employment of a public health nurse.

#### **Taylor County**

In March one member of the staff spent three days in Grafton assisting in the campaign for a clean, safe water supply for that city.

#### **Mercer County**

A visit was made by a Field Supervisor in September, 1921, to confer with the Princeton school nurse and Principal of the District schools on a school health program and to advise on their assistance to local health and city officials in control of the diphtheria epidemic then prevailing in that community. A conference was also held with the City Board of Health at a regular meeting, on sanitary conditions of Princeton schools.

In October, 1921, a visit was made to Bluefield to assist the school nurse in adjusting a program and schedule.

In February the Field Supervisor went to Bluefield to assist in the organization for the school medical examinations of the city schools. One week was spent in this work. During this time conferences were held with the city nurse and city manager on their health program.

The Nursing Committee of the Woman's Club was addressed and conferred with on Community nursing problems. At this time the school class rooms were visited for demonstration of health addresses and inspections. The Supervisor addressed a District community meeting at the invitation of the District Superintendent.

#### **McDowell County**

In October North Fork was visited, for conference with the school nurse relating to the school health program in the District. At this time an address on health was given to the high school group at request of principal.

Welch was visited in October for conference with local agencies, American Red Cross, Women's Club, County Health Officer and school officials in regard to placing a community and school nurse in that territory.

This city was again visited in January to meet the school nurse and discuss the pre-school health program with the Women's Club. A conference was also held with President of Parent-Teachers Association.

North Fork. In February this District was visited to confer with the school nurse for spring health program in the schools. A number of schools were visited and class room addresses given. During this time the industrial nurse, at Crumpler, was visited and plans made for conducting pre-school clinics.

#### **Mingo County**

Williamson was visited in October for conference with the school nurse on school health problems and with the Superintendent of schools on nutrition program and plans. The County nurse was conferred with and the supervisor accompanied her on inspection tours through the county and to the tent colonies, in particular, where an epidemic of measles had

been raging. This county was again visited in February for conference with the County Health Unit and a visit made to a rural school to observe the operation of a warm noon lunch.

#### Logan County

Logan County was visited in October, 1921, and again in April, 1922, relative to the organization of a school health program with the County Health Unit recently organized in this County. A week was spent with the county nurse in the schools at Cherrytree Bottom, Mud Fork and Aracoma schools, where health addresses were given and classroom inspections were made and children weighed and measured. During this time the supervisor accepted an invitation to come to Lundale where she addressed the Ladies Aid and school teachers of Lundale, Three Forks and Tony Forks on Child Welfare problems.

#### Lincoln County

In October, 1921, the schools of Hamlin were visited by the supervisor at the request of the superintendent of schools, to address the classes on health subjects and to interest the teachers in the conduction of simple health programs in the class room.

#### Putnam County

Late in the year 1921 this Division was requested by interested citizens of Buffalo, and later by the superintendent of schools, to make a health survey of the schools there. In February, 1922, the supervisor spent one week in the Buffalo schools in weighing and measuring the pupils, making physical inspections and addressing the classes at various opportunities on School Hygiene subjects. At the close of this week she addressed the Parent-Teachers Association on school health problems. Records for each child were left with the school principal, parent information slips were sent home and a complete report of the findings of this survey was left with the Women's Club and principal of schools.

#### Nicholas County

In the early spring a great deal of health interest was evidenced in the Teacher's Training school of Summersville. No doubt this interest was stimulated through the sociology class and the instructor in Normal Training who had a great deal of interest, and much knowledge, on health matters. The principal was no less interested, and subsequently, made a request of the State Health Commissioner to send a representative to make a health survey of the Practice School and to give classroom addresses and demonstrations on health subjects. A week was spent in this school by the Field Supervisor and the result gratifying to both the Training School and the State Department of Health.

#### Wyoming County

At the urgent invitation of Dr. Geo. Fordham and officials of the Wyoming Coal Company to this Department to assist in the conduction of a health campaign in Wyco, the Division responded by sending a Field

Nurse to that community in May. Tours of sanitary inspections were made and groups of mothers addressed at Wyco, Devil's Fork and Irquois. Three days were spent here at the conclusion of which a successful pre-school child health conference was conducted by Dr. Fordham and the State representative.

Some time was spent in assisting with preparation for the Wheeling Tuberculosis survey and one of the Field Supervisors was loaned for four weeks to assist with the field work of that survey.

At the invitation of the President of the State Federation of Women's Clubs the Director of the Division accepted the chairmanship of the Child Welfare Committee of the State Federation of Women's Clubs and in this capacity was able to reach many of the organized groups of women in the State in the interest of the Child Hygiene program as well as to present it at the State meeting of the Federation. Members of the staff also attended four of the five District Meetings of the State Federation of Women's Clubs and spoke on Maternal and Child Hygiene work in West Virginia.

### MATERNAL AND CHILD HYGIENE PROGRAM

The Governor having accepted for West Virginia the Federal funds available through the Sheppard-Towner Law, a "plan for the promotion of the welfare and hygiene of maternity and infancy," our plan for this work in West Virginia was presented to the Federal Committee for approval and was accepted in April, thus making the funds available to us in May.

A public health nurse, specially qualified for this work, who had been in the Division as a Field Supervisor was put in charge of the program. During the remainder of our fiscal year her time was devoted to the development of some of the details of the accepted program.

- (1) Motherhood Correspondence Course.
- (2) Correspondence with representative persons in our fifty-five counties regarding the development of the work.
- (3) Organization plans for the chosen counties which would make the promotion of maternal and child hygiene their primary objective.

The clerical work of the Division has been greatly increased by the development of our program during the year, and the growing demand from the people for assistance with their community and county health problems and plans. The number of letters written has been 4,064, outlines for courses of study 56, information concerning state agencies, organizations, etc., have been prepared, 120 reports compiled, 24,109 record cards provided for health work and 22,972 pieces of literature sent out, the latter mostly upon request.

Office interviews have been held with 19 prospective mothers, 71 office interviews with social workers, 159 with nurses, 109 with doctors and 83 with other persons on health matters.

The Division staff has rendered personal assistance with five pre-school child health conferences, has made 76 advisory visits to public health nurses in the State, given talks on health matters at 53 meetings and has held 276 conferences with individuals, or groups of individuals on matters, problems or plans pertaining to public health work.

## COOPERATION WITH OTHER STATE AGENCIES

### State Department of Public Schools

The Medical Inspection Card and Defect Reporting Slips (Forms 29-A and 29-B) for parents or guardians were prepared in our office by a committee composed of a representative from the State Department of Public Schools, the Vital Statistician and Public Health Nursing Division staff of the State Department of Health. School nurses of the State send monthly reports to this Division where these reports are compiled and a copy sent to the State Department of Public Schools.

In the nutrition survey put on by the Health Commissioner with the cooperation of the State Department of Public Schools, to ascertain the number of children drinking milk, tea and coffee, and the number of children going to school without breakfast, in the State, the Public Health Nursing Division drafted the questionnaire and handled the returns from the individual teachers until the data was ready for compilation. This Division also handled the correspondence incident to this stimulation.

This Division has also participated in a joint effort of the Extension Division of the State University, State Department of Public Schools, State Tuberculosis Association, and State Federation of Women's Clubs to stimulate and promote the establishment of a warm noon lunch in the rural schools of the State. In this work the Bulletin issued by the Extension Division of the State University has been used.

Literature has been sent to teachers of the State upon request and help with health programs furnished by the Division Staff in various schools of the State.

### STATE TUBERCULOSIS SANITARIUM

The Superintendent of the State Tuberculosis Sanitarium sends us a monthly report of all cases discharged from the Institution during the month, with the home address of the patient, the length of time each person remained in the Sanitarium and his or her condition upon discharge. All deaths are reported also in same way. This information is sent from the Division to the public health nurse of that community or county, wherever such workers are located, for follow-up work with the patient and the family. One hundred and ninety-eight cases have been reported in this way during seven months of this past year and follow-up work, through public health nurses, has been possible in one hundred and twenty-eight cases.

### EXTENSION DIVISION, AGRICULTURAL COLLEGE, STATE UNIVERSITY

The University Extension Division Staff was assisted in working out its health program for the 4-H Boys' and Girls' camps and later assisted with the program in the camps of ten counties by members of the State Public Health Nursing Division or by public health nurses in counties, or communities within the county. The record cards for the physical inspection of these boys and girls were sent into the division where the records were compiled. A complete report, by counties, was sent to the Univer-

sity Extension Division Director and a copy of the County report was sent to the Public Health Nurse, the Farm Bureau Agent and the Home Demonstration Agent of each county for follow-up work.

The Public Health Committee of the Farm Bureau Women's Club were assisted also during Farmer's Week in the outlining of their health program for the year.

#### LITERATURE PREPARED

A list of State Agencies has been compiled and made available to all public health nurses in the field, together with a list of State Institutions which can be of assistance in the solution of problems encountered in the development of community or county health work.

Also an outline of suggestive procedure for school nurses with a county wide territory to cover. Also health chore outlines, rhymes, songs, instructions, etc., have been prepared to assist the teachers in their health program.

The Division cooperated during the year with the Child Welfare Commission through reports coming in from public health nurses with information concerning conditions relative to dependent and delinquent children, lack of proper care and protection, need for facilities to care for crippled children, education and protection of feeble-minded, etc., all of which is embodied in the report of that commission.

During the Regional conferences of Health Officers and Public Health Nurses held in April, a full day of Round Table discussion was arranged for public health nurses in three sections of the State, Clarksburg, Charleston and Bluefield. The nurses were sent questionnaires prior to the meeting, upon which to send in questions and problems they wished to have discussed and the meetings proved interesting and profitable. Sixty nurses in all, attended these conferences.

#### RECOMMENDATIONS FOR 1923-24

##### Activities

1. More intensive field work in Maternal and pre-school hygiene program.  
Full-time of one nurse.
2. More intensive work in school health program.  
Full-time of one nurse.
3. Limited amount of survey work—five or more counties.  
Full-time of one nurse.
  - (a) To ascertain number of maternal deaths.
  - (b) To ascertain number of deaths under five years, giving age and cause.
  - (c) Survey of midwives and plan for some instruction.
4. Development of industrial public health nursing.
5. Concentrate our efforts primarily in counties having full-time Health Units.
6. Group conferences every three or four months for nurses in the field, planning definite year's program for same.

Respectfully submitted,

JEAN T. DILLON,

Director.

### VITAL STATISTICS REPORT

Dr. William T. Henshaw,  
State Commissioner of Health,  
Charleston, West Virginia.

Dear Sir:

It gives me great pleasure to tender herewith as accurate and comprehensive a report of the vital statistics of West Virginia, for the year 1921, as it is possible to assemble from such reports of births, deaths and marriages as were submitted to the Division of Vital Statistics of the State Department of Health.

This report is compiled, first, from those reports which were assembled under the provisions of the old Vital Statistics Law which was in force up to July 21, 1921, and, second, those reports which have been forwarded to this department since that time by local registrars: these latter having been appointed in accordance with the requirements of the new Vital Statistics Law, enacted by the legislature of 1920-1921.

Under the provisions of the old law, births and deaths could be reported at any time within 30 days of the occurrence, by any interested party. These reports were made direct to the County Clerk of the county in which the birth or death occurred. He spread a copy of the record upon the county books provided for that purpose. In February of the year following, the County Clerk gave a copy of his record to the Assessor, whose duty it was to ascertain, while making an assessment of the property, if the birth and death record of the county was complete and to add thereto the names of any missing births or deaths. The Assessor turned in this report to the County Clerk in August and in September a completed report was sent to the State Department of Health.

Under this system, about 50% of deaths and 60% of births were recorded.

The old system had a large number of faults. There were no interested parties whose duty it was to see that the reports were made promptly and accurately. The reports, as turned in by physicians and undertakers, often lacked important information. They were poorly made and, in many cases, were written with a lead pencil.

One of the chief objections to this system was the fact that the report reached the State Department of Health nearly a year after the original records of the births and deaths had been made.

A vital statistics report has its greatest value to the health officials of the State and County; such a report is the basis of Public Health Work; it is a barometer and records the rise and fall of the health of a state and its several communities; it indicates to the sanitarian the disease spots in those communities so that he may take adequate precautions against the spread of disease and investigate the source from whence it arises. Apart from their value in connection with public health, they indicate the growth or decline of a country. The birth, marriage and death rates denote the virility, decay or prosperity of a nation.



Recognizing the handicap that the State Department of Health was laboring under an effort was made to have a model vital statistics law placed upon the statute books. After six years of effort this has been accomplished.

The new law provides that all births be reported within 10 days and all deaths before the body is disposed of.

Births are reported by physicians and midwives, while the duty of reporting deaths rests upon the undertaker. In all cases reports are made to representatives of this department, known as Local Registrars, one or more of which are located in each magisterial district.

These Local Registrars are appointed direct from this office and are subject to removal if they fail to make proper reports. A fee of 25c is allowed the registrar for each birth or death report sent in.

Under the new law, a marked improvement is noticed both in the number of reports received and in the fullness and completeness with which these reports are made out.

	Under old law	Under new law	
	First 6 months, 1921	Second 6 months	Gain
Birth reports received	13,131	18,907	5,776
Death reports received	2,762	7,231	4,469

Seven counties, namely Gilmer, Grant, Logan, Pendleton, Randolph, Webster and Wirt, failed to turn in as many certificates of birth in the second six months as they did in the first six months, while only one county, Tucker, fell behind in death reports.

Many of the counties made enormous gains, as shown by the following table.

COUNTY	Number Births Reported First Six Months. Working Under Old Law	Number Births Reported Second Six Months. Working Under New Law	Gain	Loss	Number Deaths Reported First Six Months. Working Under Old Law	Number Deaths Reported Second Six Months. Working Under New Law	Gain	Loss
Barbour.....	200	282	82		18	86	68	
Berkeley.....	34	204	170		5	131	126	
Boone.....	17	260	243		3	63	60	
Braxton.....	96	249	153		25	78	53	
Brooke.....	171	243	72		33	77	44	
Cabell.....	518	695	177		82	441	359	
Calhoun.....	51	100	49		5	33	28	
Clay.....	89	157	68		2	38	36	
Doddridge.....	3	92	89		2	53	51	
Fayette.....	783	858	75		91	295	204	
Gilmer.....	111	61		50	19	23	4	
Grant.....	82	69		13	15	25	10	
Greenbrier.....	251	334	83		62	134	72	
Hampshire.....	80	157	77		11	53	42	
Hancock.....	248	328	80		36	97	61	
Hardy.....	7	118	111		7	24	17	
Harrison.....	667	978	311		255	376	121	
Jackson.....	21	171	150		8	56	48	
Jefferson.....	134	136	2		25	84	59	
Kanawha.....	1,308	1,745	437		406	644	238	
Lewis.....	179	206	27		110	136	26	
Lincoln.....	197	219	22		26	43	17	
Logan.....	760	676		84	120	268	148	
McDowell.....	1,029	1,108	79		187	352	165	
Marion.....	652	813	161		36	312	276	
Marshall.....	6	348	342		5	184	179	
Mason.....	200	256	56		48	97	49	
Mercer.....	700	814	114		80	257	177	
Mineral.....	244	287	43		66	147	81	
Mingo.....		265	265			78	78	
Monongalia.....	515	533	18		103	189	86	
Monroe.....	76	161	85		16	51	35	
Morgan.....	116	131	15		23	49	26	
Nicholas.....	234	290	56		20	54	34	
Ohio.....	182	637	455		44	406	362	
Pendleton.....	113	111		2	31	37	6	
Pleasants.....	37	106	69		1	35	34	
Pocahontas.....		182	182			76	76	
Preston.....	343	392	49		78	153	75	
Putnam.....	158	189	31		35	49	14	
Raleigh.....	655	788	133		100	218	118	
Randolph.....	431	372		59	4	121	117	
Ritchie.....	158	203	45		48	71	23	
Roane.....	177	279	102		76	118	42	
Summers.....	33	137	104		24	77	53	
Taylor.....	6	229	223		2	101	99	
Tucker.....	180	238	58		94	71		23
Tyler.....	69	145	76		40	70	30	
Upshur.....	141	195	54		88	92	4	
Wayne.....	13	228	215			62	62	
Webster.....	214	188		26	17	42	25	
Wetzel.....	217	288	71		71	113	42	
Wirt.....	62	59		3	16	36	20	
Wood.....	156	434	278		41	215	174	
Wyoming.....	7	163	156		2	40	38	
Total.....	13,131	18,907	6,013	237	2,782	7,231	4,492	23
Total Gain.....				5,576	Total	Gain.....		4,469

The Division of Vital Statistics at the present time is composed of the director and six operatives, working at Charleston, and about 400 local registrars located here and there all over the State. Great care has been taken to organize the work so that it may be carried on, as is done in those States which are in the registration area. Up-to-date equipment, in the way of punch machines, electrical sorters and adding machines, has been installed.

Our aim is to place West Virginia in the registration area as soon as possible. This is a Herculean task and must be based upon a campaign of education. Our people have to be taught the value of these records. As soon as we have a registration of 90% or more of deaths we shall apply to the Census Bureau at Washington, D. C., for admittance to the registration area. Only two States east of the Mississippi River—Alabama and West Virginia—are not thus included. Better enforcement of our registration laws could be secured if we were able to place in the field a supervisor who could travel from place to place, instruct the people as to the value of these records and check up the records as made. It is the hope of this division that the next legislature will provide sufficient funds so that such a supervisor may be employed.

The following fifteen tables are self-explanatory.

Yours very truly,

CARL F. RAVEN,

Director of the Division of Vital Statistics.

TABLE I

General Summary by Individual Counties Showing Number of Births, Stillbirths, Deaths and Marriages as Reported for 1921

COUNTY	Total Births Stillbirths Excluded	Stillbirths	Total Deaths Stillbirths Excluded	Total Marriages
Barbour.....	482	15	104	140
Berkeley.....	238	11	136	183
Boone.....	277	8	66	188
Braxton.....	345	14	103	184
Brooke.....	414	13	110	2,434
Cabell.....	1,213	60	523	600
Calhoun.....	151	5	38	102
Clay.....	246	9	40	111
Doddridge.....	95	7	55	91
Fayette.....	1,641	47	386	484
Gilmer.....	172	1	42	81
Grant.....	151	7	40	35
Greenbrier.....	585	32	196	201
Hampshire.....	237	14	64	35
Hancock.....	576	21	133	364
Hardy.....	125	6	31	44
Harrison.....	1,645	51	631	635
Jackson.....	192	3	64	129
Jefferson.....	270	11	109	137
Kanawha.....	3,053	128	1,050	1,655
Lewis.....	385	18	246	145
Lincoln.....	416	14	69	163
Logan.....	1,436	47	388	550
McDowell.....	2,137	94	539	883
Marion.....	1,465	50	348	507
Marshall.....	354	14	189	244
Mason.....	456	8	145	163
Mercer.....	1,514	44	337	688
Mineral.....	1,531	29	213	118
Mingo.....	265	15	78	417
Monongalia.....	1,048	40	292	331
Monroe.....	237	4	67	101
Morgan.....	247	5	72	63
Nicholas.....	524	22	74	203
Ohio.....	819	39	450	1,577
Pendleton.....	224	11	68	59
Pleasants.....	143	3	36	101
Pocahontas.....	182	6	76	61
Preston.....	735	20	231	133
Putnam.....	347	10	84	127
Raleigh.....	1,443	26	318	511
Randolph.....	803	26	125	206
Ritchie.....	361	12	119	126
Roane.....	456	15	194	163
Summers.....	170	9	101	197
Taylor.....	235	8	103	136
Tucker.....	418	12	165	119
Tyler.....	214	4	110	97
Upshur.....	336	10	180	170
Wayne.....	241	8	62	104
Webster.....	402	12	59	88
Wetzel.....	505	13	184	227
Wirt.....	121	3	52	42
Wood.....	590	21	256	568
Wyoming.....	170	3	42	150
Total.....	32,038	1,131	9,993	17,401

**TABLE II**  
**Births Reported in Each County During 1921 Classified as to Color, Sex, and Stillbirths**

COUNTY	White Males	White Females	Colored Males	Colored Females	Total Living Births	Still Births
Barbour.....	237	216	16	13	482	15
Berkeley.....	113	115	6	4	238	11
Boone.....	136	127	10	4	277	8
Braxton.....	157	187	1		345	14
Brooke.....	211	194	6	3	414	13
Cabell.....	618	564	15	16	1,213	60
Calhoun.....	77	74			151	5
Clay.....	139	105		2	246	9
Doddridge.....	42	53			95	7
Fayette.....	732	681	104	124	1,641	47
Gilmer.....	88	83	1		172	1
Grant.....	78	71		2	151	7
Greenbrier.....	309	241	13	22	585	32
Hampshire.....	133	102	2		237	14
Hancock.....	267	296	9	4	576	21
Hardy.....	55	68	2		125	6
Harrison.....	817	774	28	26	1,645	51
Jackson.....	89	103			192	3
Jefferson.....	115	97	35	23	270	11
Kanawha.....	1,473	1,401	89	83	3,053	128
Lewis.....	192	191	1	1	385	18
Lincoln.....	205	210		1	416	14
Logan.....	739	626	31	40	1,436	47
McDowell.....	866	853	207	211	2,137	84
Marion.....	726	664	37	38	1,465	50
Marshall.....	182	170	1	1	354	14
Mason.....	249	207			456	8
Mercer.....	785	635	53	41	1,514	44
Mineral.....	263	249	9	10	531	29
Mingo.....	126	129	3	7	265	15
Monongalia.....	528	497	10	13	1,048	40
Monroe.....	122	104	4	7	237	4
Morgan.....	127	115	3	2	247	5
Nicholas.....	274	249	1		524	22
Ohio.....	402	395	16	6	819	39
Pendleton.....	107	117			224	11
Pleasants.....	63	80			143	3
Pocahontas.....	106	71	2	3	182	6
Preston.....	376	356	2	1	735	20
Putnam.....	170	171	4	2	347	10
Raleigh.....	639	626	92	86	1,443	26
Randolph.....	399	394	4	6	803	29
Ritchie.....	178	183			361	12
Roane.....	224	232			456	15
Summers.....	87	76	4	3	170	9
Taylor.....	124	104	3	4	235	8
Tucker.....	211	205	1	1	418	12
Tyler.....	114	98		2	214	4
Upshur.....	159	175	1	1	336	10
Wayne.....	129	110		2	241	8
Webster.....	200	201	1		402	12
Wetzel.....	240	264		1	505	13
Wirt.....	68	53			121	3
Wood.....	313	267	4	6	590	21
Wyoming.....	84	71	5	10	170	3
Total.....	15,663	14,707	836	832	32,038	1,131

TABLE III

Births as Reported for 1921; Listed by Counties, Showing Total Number of Living Births; Number of Illegitimate Births; Number of Children Named at Time Certificate was Filled; Number of Births where Prophylaxis was Used to Prevent Ophthalmia Neonatorum; Number of Children Born as Twins as Triplets; Number of Children Attended at Birth by a Physician

COUNTY	Total Number Living Births	Illegitimate	Number Named	Percent Named	Number Births Where Eye Drops Were Used	Living Children Born as		Child and Mother Attended by	
						Twins	Triplets	Physician	Midwife or Other
Total.....	32,038	772	24,591	76.76	26,181	891	5	29,626	2,412
Barbour.....	482	14	239	49	320	3		462	20
Berkeley.....	238	11	85	35	170	2		228	10
Boone.....	277	10	222	80	209	3		233	44
Braxton.....	345	15	286	82	183	2		224	121
Brooke.....	414	10	346	83	344	4		411	3
Cabell.....	1,213	30	924	76	938	10		1,175	38
Calhoun.....	151	3	146	96	26	3		95	56
Clay.....	246	8	189	76	159	2		183	63
Doddridge.....	95	1	80	84	81	3		89	6
Fayette.....	1,641	34	1,367	83	1,428	24	3	1,627	14
Gilmer.....	172	3	145	84	68	2		141	31
Grant.....	151	2	136	90	121	4		139	12
Greenbrier.....	585	22	507	86	398	12		523	62
Hampshire.....	237	7	185	78	188	4		220	17
Hancock.....	576	6	445	77	465	7		480	96
Hardy.....	125	6	89	71	80	3		109	16
Harrison.....	1,645	44	1,486	90	1,552	19		1,620	25
Jackson.....	192	2	136	70	149	2		180	12
Jefferson.....	270	16	203	75	217	2		266	4
Kanawha.....	3,053	65	2,574	84	2,765	35		3,021	32
Lewis.....	388	9	347	90	325	7		374	11
Lincoln.....	416	12	350	84	184	11		204	212
Logan.....	1,436	25	1,097	76	1,120	21		1,167	269
McDowell.....	2,137	45	1,665	77	1,862	26		2,092	45
Marion.....	1,465	35	1,308	89	1,319	16		1,438	27
Marshall.....	354	4	335	94	310	1		342	12
Mason.....	456	11	256	56	375	7		430	26
Mercer.....	1,514	27	1,005	66	1,418	19		1,479	35
Mineral.....	531	17	364	49	457	4		509	22
Mingo.....	265	5	215	81	219	5		249	16
Monongalia.....	1,048	19	718	68	869	11		972	76
Monroe.....	237	6	181	76	212	4		227	10
Morgan.....	247	12	138	55	195	3		207	40
Nicholas.....	524	12	327	62	406	3		496	28
Ohio.....	819	18	703	85	727	8		735	84
Pendleton.....	224	18	154	68	159	2		168	56
Pleasants.....	182	4	109	76	124	2		132	11
Pocahontas.....	735	5	51	44	127	4		170	12
Preston.....	347	24	543	73	570	9		730	5
Putnam.....	347	2	262	75	229	4		261	86
Raleigh.....	1,443	43	1,096	76	1,202	22	1	1,329	114
Randolph.....	808	22	484	60	609	11		689	114
Ritchie.....	303	6	239	66	325	1		357	4
Roane.....	456	11	366	80	364	7		416	40
Summers.....	170	4	113	66	108	2		144	26
Taylor.....	235	5	209	89	232	4		234	1
Tucker.....	418	8	324	77	337	4	1	371	47
Tyler.....	214	6	139	65	193	2		209	5
Upshur.....	336	9	254	75	243	4		311	25
Wayne.....	241	3	185	68	138	3		195	46
Webster.....	402	17	316	78	249	3		313	89
Wetzel.....	505	10	405	80	362	8		416	89
Wirt.....	121	4	82	51	87	1		118	3
Wood.....	590	12	461	78	538	8		571	19
Wyoming.....	170	3	110	64	124	1		145	25

**TABLE IV**  
**Total Living Births in West Virginia for Five Years Classified by Counties**

COUNTY	1917	1918	1919	1920	1921
Barbour.....	398	324	285	330	482
Berkeley.....		352	158	31	238
Boone.....		390	286	9	277
Braxton.....	550	165	365	403	345
Brooke.....	161	141	130	267	414
Cabell.....	971	866	882	1,106	1,213
Calhoun.....	225	217	169	170	151
Clay.....	189	274	238	161	246
Doddridge.....	157	67	133	124	95
Fayette.....	1,474	1,229	1,408	1,293	1,641
Gilmer.....	269	280	212	262	172
Grant.....	160	220	176	197	151
Greenbrier.....	366	623	498	474	585
Hampshire.....	96	166	131	172	237
Hancock.....	405	265	348	462	576
Hardy.....	116	78	54	45	125
Harrison.....	1,071	2,003	1,492	1,647	1,645
Jackson.....	437	454	410	371	192
Jefferson.....	192	251	288	279	270
Kanawha.....	1,812	1,998	1,933	2,095	3,053
Lewis.....	379	348	308	347	385
Lincoln.....	228	327	451	435	416
Logan.....		1,581	1,190	1,338	1,436
McDowell.....	1,425	1,735	1,683	1,977	2,137
Marion.....	1,198	1,198	1,060	931	1,465
Marshall.....		622	529	441	354
Mason.....		352	274	366	456
Mercer.....	958	1,453	1,245	1,196	1,514
Mineral.....	405	359	393	582	531
Mingo.....	768	489	449	260	265
Monongalia.....		891	760	938	1,048
Monroe.....	422	123	115	279	237
Morgan.....	143	267	186	227	247
Nicholas.....	714	658	447	481	524
Ohio.....	1,131	1,184	954	960	819
Pendleton.....	203	200	176	188	224
Pleasants.....	44	180	106	69	143
Pocahontas.....	562	43	168	11	182
Preston.....	598	768	599	530	735
Putnam.....	414	125	210	485	347
Raleigh.....		970	970	1,296	1,443
Randolph.....	609	591	705	570	803
Ritchie.....	298	560	352	520	361
Roane.....		420	320	24	456
Summers.....	415	75	242	12	170
Taylor.....	234	351	360	1	235
Tucker.....	436	407	459	411	418
Tyler.....	338	323	198	226	214
Upshur.....	102	363	379	328	336
Wayne.....	394	284	645	399	241
Webster.....	217	267	290	276	402
Wetzel.....	320	690	504	492	505
Wirt.....	96	124	83	167	121
Wood.....	488	316	539	438	590
Wyoming.....	302	14	37	11	170
Total.....	22,890	29,021	26,982	27,650	32,088

TABLE V  
Death Reports for Five Years Classified by Counties

COUNTY	1917	1918	1919	1920	1921
Barbour.....	169	138	101	96	104
Berkeley.....	4	244	67	6	136
Boone.....		109	67	1	66
Braxton.....	147	31	80	66	103
Brooke.....	55	97	37	59	110
Cabell.....	303	393	215	210	523
Calhoun.....	36	43	35	26	38
Clay.....	68	112	32	4	40
Doddridge.....	74	60	48	68	55
Fayette.....	322	427	247	245	386
Gilmer.....	59	55	48	48	42
Grant.....	38	54	39	41	40
Greenbrier.....	54	106	121	93	196
Hampshire.....	61	41	33	34	64
Hancock.....	90	60	64	97	133
Hardy.....	30	21	10	1	31
Harrison.....	887	1,258	798	859	631
Jackson.....	139	75	108	120	64
Jefferson.....	133	177	143	77	109
Kanawha.....	480	864	758	803	1,050
Lewis.....	272	275	207	272	246
Lincoln.....	11	27	69	25	69
Logan.....		804	457	470	388
McDowell.....	493	581	389	439	539
Marion.....	616	926	606	769	348
Marshall.....	15	182	207	187	189
Mason.....		202	107	153	145
Mercer.....	253	367	191	179	337
Mineral.....	252	280	132	170	213
Mingo.....	279	178	72	41	78
Monongalia.....	2	468	322	333	292
Monroe.....	110	25	21	68	67
Morgan.....	116	123	47	51	72
Nicholas.....	161	144	56	50	74
Ohio.....	979	1,174	940	1,108	450
Pendleton.....	58	62	64	52	68
Pleasants.....	21	78	34		36
Pocahontas.....	194	17	45	1	76
Preston.....	506	383	259	206	231
Putnam.....	123	527	130	80	84
Raleigh.....	5	179	130	221	318
Randolph.....	292	441	281	261	125
Ritchie.....	92	122	106	115	119
Roane.....	15	101	99	1	194
Summers.....	166	174	116		101
Taylor.....	144	204	233	3	103
Tucker.....	116	316	188	185	165
Tyler.....	120	151	143	163	110
Upshur.....	71	248	203	182	180
Wayne.....	70	43	128	88	62
Webster.....	22	64	59	16	59
Wetzel.....	206	327	252	224	184
Wirt.....	45	46	32	34	52
Wood.....	272	164	360	222	256
Wyoming.....	25	7	16	11	42
Total.....	9,262	13,745	9,752	9,334	9,993



**TABLE VI**  
**Number of Deaths in the Entire State by Sex, Color, Marital Condition and General Nativity, as Reported for 1921**

Total Deaths.....	9,993		
Sex:			
Male.....	5,487		
Female.....	4,506		
<hr/>			
	Male	Female	Total
Color:			
White.....	4,967	4,173	9,140
Negro.....	513	323	836
Unknown.....	7	10	17
Marital Condition:			
Single.....	2,999	2,196	5,195
Married.....	1,897	1,523	3,420
Widowed.....	440	747	1,187
Divorced.....	29	14	43
Unknown.....	122	26	148
General Nativity:			
Native to West Virginia.....	3,677	3,262	6,939
Native to Other States.....	1,371	1,047	2,418
Foreign Born.....	292	135	427
Unknown.....	147	62	209

**TABLE VII**  
**Number of Deaths for Each Month in Entire Year as Reported for 1921**

MONTH	Male	Female	Total
January.....	278	254	532
February.....	265	204	469
March.....	252	185	437
April.....	261	196	457
May.....	218	200	418
June.....	254	195	449
July.....	468	399	867
August.....	720	597	1,317
September.....	661	535	1,196
October.....	741	604	1,345
November.....	690	537	1,227
December.....	679	600	1,279
Total.....	5,487	4,506	9,993

**TABLE VIII**  
**Number and Per Cent of Deaths of Each Age Period in the Entire State as Reported for 1921**

AGE	DEATHS			Per Cent
	Total	Male	Female	
Total deaths of all ages.....	9,993	5,487	4,506	100.0
Under one year.....	2,331	1,320	1,011	23.3
Second, third, fourth years.....	1,051	536	515	10.5
Total under five years.....	3,382	1,856	1,526	33.8
5-9.....	384	214	170	3.9
10-19.....	554	272	282	5.5
20-29.....	824	465	359	8.3
30-39.....	803	458	345	8.1
40-49.....	719	432	287	7.2
50-59.....	690	391	299	6.9
60-69.....	899	494	405	9.0
70-79.....	1,012	534	478	10.1
80-89.....	550	270	280	5.5
90 plus.....	84	32	52	.8
Unknown age.....	92	69	23	.9

TABLE IX

Number of Deaths as Reported for 1921 Classified by Sex and Color and Important Causes of Death

PRINCIPAL CAUSE OF DEATH	Total	SEX		COLOR		
		Male	Female	White	Negro	Unknown
Total.....	9,993	5,487	4,506	9,140	836	17
Typhoid Fever (1).....	274	158	116	249	25	
Smallpox (5).....	3	3		3		
Measles (6).....	60	30	30	56	4	
Scarlet Fever (7).....	58	26	32	57		1
Whooping Cough (8).....	120	58	62	109	11	
Diphtheria (9).....	405	213	192	396	9	
Influenza (10).....	35	24	11	31	4	
Tuberculosis of Lungs (28-29).....	596	272	324	507	88	1
Tuberculosis of other Organs (30-35).....	93	47	46	78	14	1
Syphilis (37).....	58	39	19	40	16	2
Cancer (39-45).....	368	135	233	353	15	
Acute and Chronic Rheumatism (47-48).....	22	9	13	22		
Diabetes (50).....	76	37	39	72	3	1
Meningitis (61).....	117	55	62	109	8	
Apoplexy (64).....	312	167	145	285	27	
Organic Disease of Heart (79).....	415	224	191	383	31	1
Acute and Chronic Bronchitis (89-90).....	28	14	14	24	4	
Bronchial Pneumonia (91).....	317	184	133	283	32	2
Pneumonia (92).....	349	191	158	317	32	
Diarrhoea Enteritis, under 2 years (104).....	1,088	569	519	1,031	56	1
Acute and Chronic Nephritis (119-120).....	454	249	205	400	54	
Diseases of Puerperal State (134-141).....	161		161	150	11	
Congenital Malformation (150).....	44	27	17	43	1	
Diseases of early infancy (151-153).....	1,018	580	438	953	64	1
Senility (154).....	487	214	273	477	10	
Suicide (155-163).....	52	40	12	51	1	
Accidents (154-181).....	796	647	149	664	131	1
Homicide (182-184).....	61	54	7	43	18	
Fractures, Violence, Sudden Death (185-188).....	164	134	30	146	18	
All other specified causes.....	1,753	975	778	1,608	141	4
All causes not specified (189).....	209	112	97	200	8	1



TABLE XI

Number of Deaths as Reported in 1921 Classified in Broad Age Groups and Important Causes of Death

PRINCIPAL CAUSES OF DEATH	AGES							Total
	Under 1 yr.	1-4	5-19	20-39	40-59	60+	Un-known	
Total.....	2,331	1,051	938	1,627	1,409	2,545	92	9,993
Typhoid Fever (1).....	6	12	102	103	41	9	1	274
Smallpox (5).....	15	28	10	2	1	1	1	3
Measles (6).....	6	13	37	2	2	2	1	60
Scarlet Fever (7).....	61	55	3	7	5	3	1	58
Whooping Cough (8).....	10	214	165	7	5	13	1	120
Diphtheria (9).....	2	1	4	10	5	13	1	405
Influenza (10).....	1	10	53	304	147	70	11	35
Tuberculosis of Lung (28-29).....	8	13	26	26	9	10	1	596
Tuberculosis of other Organs (30-35).....	22	3	3	10	14	5	1	93
Syphilis (37).....	2	2	2	33	139	191	1	58
Cancer (39-45).....	.....	.....	.....	.....	.....	.....	.....	368
Acute and Chronic Rheumatism (47-48).....	.....	.....	2	4	8	8	.....	22
Diabetes (50).....	.....	2	13	12	13	36	.....	76
Meningitis (61).....	44	33	18	11	6	5	.....	117
Apoplexy (64).....	.....	.....	1	17	85	208	1	312
Organic Disease of Heart (79).....	1	.....	2	23	80	308	1	415
Acute and Chronic Bronchitis (89-90).....	8	4	1	1	2	12	.....	28
Bronchial Pneumonia (91).....	139	96	20	11	12	38	1	317
Pneumonia (92).....	25	21	34	63	68	134	4	349
Diarrhoea, Enteritis, under 2 years (104).....	815	273	.....	.....	.....	.....	.....	1,088
Acute and Chronic Nephritis (134-141).....	2	5	20	43	89	290	5	454
Diseases of Puerperal State (150).....	.....	.....	19	123	16	.....	3	161
Congenital Malformation (151-153).....	41	1	1	1	.....	.....	.....	44
Diseases of Early Infancy (151-153).....	998	17	.....	.....	.....	.....	3	1,018
Senility (154).....	.....	.....	.....	.....	.....	484	3	487
Suicide (155-163).....	.....	.....	3	20	21	5	3	52
Accidents (164-181).....	30	82	139	348	140	37	20	796
Homicide (182-184).....	1	.....	2	38	16	1	3	61
Fractures, Violence, Sudden Death (185-188).....	1	6	23	66	34	27	7	164
All other Specified Causes.....	88	135	198	301	406	613	12	1,753
All Causes not Specified (189).....	7	25	36	48	50	35	8	209

TABLE XII  
Cases of and Deaths from Important Communicable Diseases as Reported During 1921—Listed by Counties

COUNTIES	Diphtheria (9)		Influenza (10)		Measles (6)		Meningitis (61)		Scarlet Fever (7)		Smallpox (5)		Tuberculosis (28-35)		Typhoid (1)		Whooping Cough (8)			
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths		
Total	3,938	35	744	35	7,004	60	48	117	2,611	58	2,444	3	267	689	1,807	274	2,070	120		
Barbour	46	4	12	1	25	1	1	34	2	23	2	5	11	49	45	3	49	1		
Berkeley	75	4	1	1	13	1	1	39	5	4	4	2	5	44	6	9	180	1		
Bowie	27	1	3	1	11	1	6	3	5	1	1	2	5	7	1	1	80	1		
Brazier	124	9	62	1	121	1	3	35	1	56	1	10	10	52	1	60	282	1		
Brown	82	7	4	1	20	1	1	77	1	1	1	4	6	7	1	5	183	1		
Charles	149	13	1	3	178	3	1	4	55	1	8	1	3	49	53	21	5	276	1	
Clay	12	7	7	1	108	4	1	1	5	1	1	1	3	6	7	7	96	1		
Deale	11	4	15	6	6	1	2	23	2	2	2	6	4	7	6	3	17	76	1	
Doddridge	191	18	28	1	1,726	2	3	4	133	2	96	1	11	23	10	342	10	84	1	
Fayette	13	1	1	1	1	1	1	25	1	21	1	1	6	43	3	20	284	1		
Gilmer	1	1	1	1	5	1	1	11	1	4	1	1	1	12	1	1	90	1		
Grafton	1	2	7	1	1	1	1	78	5	1	1	1	1	33	9	1	186	1		
Greenup	34	9	8	1	41	1	1	76	1	1	1	1	1	14	3	1	178	1		
Hampshire	11	1	1	1	10	1	1	1	50	1	2	2	3	27	3	1	78	1		
Hancock	24	1	2	1	16	1	1	1	1	1	1	1	3	6	5	1	1	77	1	
Harrison	3	2	2	1	2	1	1	27	1	1	1	1	3	6	1	1	71	1		
Jefferson	304	16	62	3	90	5	4	14	176	10	184	1	1	46	43	12	41	12	100	1
Jackson	83	3	27	1	59	1	1	1	42	1	3	1	2	2	6	1	30	170	1	
Kanawha	100	21	1	1	4	1	1	1	1	1	4	1	1	25	1	63	75	1		
Kearney	279	27	83	2	1,318	15	6	10	128	4	135	1	29	82	148	18	105	11	84	1
Lawrence	66	3	9	1	67	1	1	1	21	1	148	1	1	27	44	5	1	109	1	
Letcher	8	5	2	1	228	4	1	2	2	1	1	1	1	5	4	1	84	1		
Lincoln	18	11	6	2	216	7	3	13	1	1	63	1	1	21	10	6	1	184	1	
Madison	70	20	4	1	299	3	1	8	28	1	143	2	20	55	23	9	1	184	1	
Marshall	211	15	117	3	163	1	1	3	199	1	73	1	2	15	11	21	57	69	1	
Martin	95	14	2	1	142	1	2	2	116	4	13	1	2	32	5	2	4	477	1	
Mason	26	7	12	3	1	1	1	4	28	1	14	1	1	13	1	217	380	1		
Mercer	246	13	14	1	196	1	1	7	120	1	276	1	1	17	13	2	256	1		
Meigs	39	7	2	1	188	1	1	1	31	1	110	1	2	15	3	157	9	66	1	
Mingo	51	5	5	1	252	1	3	1	9	1	16	1	2	17	87	5	12	1	1	1
Monongalia	152	4	28	2	22	1	1	1	101	1	110	1	13	15	39	5	12	1	1	1
Monroe	28	10	26	1	37	1	1	1	37	1	4	1	9	9	4	104	4	1	1	1
Morgan	3	1	19	2	21	1	1	1	4	1	39	1	2	4	39	1	39	2	1	1
Nicholas	75	1	1	1	16	1	1	1	63	1	119	1	13	6	23	1	1	1	1	1

Ohio	295	17	1	230	2	253	4	20	15	24	14	12	16	1
Pauldon	20	4	1	40	1	31			1	22			3	
Pearse	30	4	1			5		1		8	2	3		
Pearson	27	12	16	9		4				13	1	30		
Pearson's	22	6	2	82	1	1				19	2	3		
Peyton	18	8	10	55		36	4	121	17	47	12	40	3	
Pugh	18	8	1	55		14			17	22	4	6		
Raleigh	85	15	1	186	4	2			4	17	94	9	62	5
Randolph	253	19	5	155		1		40		67	9	39		
Ritzkie	37	8	1	31		1		14		7	2			
Rease	43	1	1	6		31		21	1	8	9	2	2	
Reese	43	1	1	2		55		21	4	15	50	5	5	
Summers	44	3	11	345		1	1	120	20	10	40			
Taylor	67	3	22	8		43	2	37	10	23				
Tucker	16	5	13	8		2		7	4	22	7	203		
Tyler	6	1				3	1	1	25	2	2	9	2	
Upshur	6	1				9		16	1	14	12	4		
Wayne	19	2	14	8		1	1	15	1	22	4			
Webster	14	8	19			10	1	38	2	33	6	24	5	
Webster	15	2	9	1		8		15	2	30	4			
Wetzel	10	9	1	2		11		24	2	9				
Wetzel	10	9	16	31	2	1		107	2	6	2	61	3	
Wirt	27	6	2	45		1		15	5	4	15	3	153	
Wood	229	6	2	5		4	1	29	8	36	10			
Wyoming	10	4		37		1		22	5	1	1	6		

TABLE XIII  
Marriages in West Virginia for Five Years Classified by Counties

COUNTY	1917	1918	1919	1920	1921
Barbour.....	135	119	142	154	140
Berkeley.....	138	140	191	192	183
Boone.....	216	122	186	231	188
Braxton.....	210	169	229	242	184
Brooke.....	2,281	2,050	2,495	2,863	2,434
Cabell.....	520	426	589	703	600
Calhoun.....	85	82	99	130	102
Clay.....	91	116	131	123	184
Brooke.....	2,281	2,050	2,495	2,863	2,434
Cabell.....	520	426	589	703	600
Calhoun.....	85	82	99	130	102
Clay.....	91	116	131	123	111
Doddridge.....	103	71	99	116	91
Fayette.....	439	430	481	581	484
Gilmer.....	75	70	110	97	81
Grant.....	39	28	42	36	35
Greenbrier.....	221	169	233	237	201
Hampshire.....	43	44	39	49	35
Hancock.....	479	395	465	455	364
Hardy.....	59	53	58	63	44
Harrison.....	615	529	696	805	635
Jackson.....	160	119	138	141	129
Jefferson.....	128	119	166	176	137
Kanawha.....	1,578	1,470	1,878	2,108	1,655
Lewis.....	141	103	103	177	145
Lincoln.....	143	121	140	156	163
Logan.....	347	424	498	626	550
McDowell.....	903	852	927	933	863
Marion.....	407	372	441	507	507
Marshall.....	241	246	301	336	244
Mason.....	241	223	246	254	163
Mercer.....	544	464	629	659	688
Mineral.....	117	79	116	127	118
Mingo.....	475	474	597	551	417
Monongalia.....	308	209	253	325	331
Monroe.....	99	73	85	97	101
Morgan.....	74	32	57	65	63
Nicholas.....	184	119	177	199	203
Ohio.....	603	1,186	1,408	1,668	1,577
Pendleton.....	81	59	70	82	59
Pleasants.....	116	72	102	93	101
Pocahontas.....	155	88	124	144	61
Preston.....	155	108	137	160	133
Putnam.....	130	100	139	136	127
Raleigh.....	475	425	475	492	511
Randolph.....	212	150	228	257	206
Ritchie.....	114	61	111	137	126
Roane.....	174	113	217	215	163
Summers.....	215	172	235	260	197
Taylor.....	140	96	141	147	136
Tucker.....	114	87	102	155	119
Tyler.....	110	73	116	108	97
Upshur.....	146	122	148	191	170
Wayne.....	136	121	166	175	104
Webster.....	241	78	119	104	88
Wetzel.....	241	186	255	277	227
Wirt.....	51	42	56	64	42
Wood.....	629	529	666	773	598
Wyoming.....	110	110	161	131	150
Total.....	16,230	14,470	18,273	20,373	17,401

TABLE XIV  
Marriages During 1921 Classified for Each County by Months

COUNTIES	MONTHS												Total
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Barbour.....	6	8	12	10	21	11	13	13	8	10	11	17	140
Berkeley.....	14	26	15	13	14	15	12	8	11	19	17	19	183
Boone.....	14	18	20	18	19	14	16	12	5	14	16	22	188
Braxton.....	15	9	18	10	15	19	20	12	10	12	13	23	184
Brooke.....	189	186	198	211	187	240	189	174	238	224	212	186	2,434
Cabell.....	62	43	64	36	41	52	48	46	51	42	47	08	600
Calhoun.....	6	12	9	14	10	5	8	5	6	12	5	10	102
Clay.....	6	8	15	11	4	13	18	9	5	18	3	11	111
Doddridge.....	5	5	4	8	10	10	6	8	13	5	8	9	91
Fayette.....	20	41	39	44	32	62	40	39	40	31	42	39	484
Gilmer.....	8	4	6	10	13	6	5	9	1	8	6	5	81
Grant.....	1		8	5		3	1	4	0	2	2	3	35
Greenbrier.....	10	4	29	26	13	20	14	14	4	22	23	22	201
Hamphshire.....	1	5	4	2		7	2		3	2	4	4	35
Hancock.....	24	43	33	35	24	38	34	27	31	20	34	31	364
Hardy.....	4		7	1		6	2		4	6		4	44
Harrison.....	49	39	53	53	50	70	49	57	54	54	66	41	635
Jackson.....	5	9	7	9	12	13	8	12	12	17	9	17	139
Jefferson.....	12	12	6		7	14	12	9	13	16	10	18	137
Kanawha.....	150	186	157	142	188	150	130	110	158	117	108	109	1,655
Lewis.....	4	8	6	19	7	9	17	9	17	19	17	13	145
Lincoln.....	9	4	16	17	11	14	20	18	24	12	3	15	163
Logan.....	53	39	35	48	55	44	40	35	33	55	61	49	550
McDowell.....	37	64	75	36	90	90	81	61	72	67	64	76	883
Marion.....	40	31	38	33	49	63	38	42	40	46	35	52	507
Marshall.....	22	13	21	22	15	20	13	16	31	23	23	35	244
Mason.....	14	9	16	15	9	15	12	11	17	20	11	14	163
Mercer.....	50	36	73	54	81	67	49	64	59	62	83	68	688
Mineral.....	12	10	8	8	10	22	4	7	8	11	9	9	118
Mingo.....	43	39	59	38	35	31	8	31	28	17	42	46	417
Monongalia.....	16	27	29	30	20	38	28	28	27	30	31	27	351
Monroe.....	4	5	12	8	4	13	5	7	11	10	9	13	101
Morgan.....	10	3	5	6	3	8	5	2	7	7	2	5	63
Nicholas.....	6	9	15	25	10	28	21	12	16	20	16	31	203
Ohio.....	133	106	181	140	122	163	122	110	135	134	129	102	1,577
Pendleton.....	3	2	6	3	11	4	4	2	4	4	7	9	59
Pleasants.....	4	6	5	8	7	6	7	13	18	12	10	10	101
Pocahontas.....	15	9	11	13	10	14	13	15	11	9	9	4	133
Preston.....	5	4	15	15	10	15	5	9	12	11	12	14	127
Putnam.....	27	24	35	42	39	76	38	38	46	49	48	49	511
Raleigh.....	16	11	20	20	12	29	18	13	14	10	16	18	206
Randolph.....	11	10	8	7	14	15	12	10	6	11	10	12	126
Ritchie.....	9	12	19	28	7	14	8	10	11	17	16	12	163
Roane.....	12	13	16	15	23	17	11	19	20	21	13	17	197
Summers.....	13	6	12	10	12	19	14	8	8	11	10	13	136
Taylor.....	15	8	13	10	6	16	8	11	6	5	6	15	119
Tucker.....	7	7	4	8	7	12	12	4	10	10	11	5	97
Upshur.....	9	11	17	20	13	9	12	13	19	11	10	26	170
Wayne.....	15	10	12	8	8	11	8	9	4	7	6	6	104
Wetzel.....	5	5	8	5	6	10	7	8	7	4	10	13	88
Wetzel.....	10	11	23	18	22	16	28	18	25	15	16	25	227
Wirt.....	1	3	5	4	1	2	7	6		3	4	6	42
Wood.....	39	39	38	41	31	50	100	60	67	42	41	51	598
Wyoming.....	10	10	9	13	15	15	8	21	15	13	11	10	150
Total.....	1,309	1,213	1,509	1,509	1,368	1,748	1,380	1,309	1,505	1,400	1,422	1,063	17,401



TABLE XV

Number Married in Each County in 1921, Classified by Sex and Age Groups

COUNTIES		YEARS												Total
		Under 20	From 20-24	From 25-29	From 30-34	From 35-39	From 40-44	From 45-49	From 50-59	From 60-69	From 70-79	80 and over		
Barbour.....	M	5	67	33	13	7	4	4	4	2	1		140	
	F	55	47	16	8	5	5	4						
Berkeley.....	M	1	75	47	22	13	7	6	9	3			183	
	F	32	98	20	11	9	6	3	3	1				
Boone.....	M	10	78	43	27	14	6	6	2	1	1		188	
	F	91	68	8	4	8	6	2		1				
Braxton.....	M	11	77	45	18	12	8	3	5	4	1		184	
	F	59	79	24	5	7	4	2	2	2				
Brooks.....	M	23	1,587	458	150	92	53	29	31	9	2		2,434	
	F	141	1,917	172	76	57	36	12	19	4				
Cabell.....	M	20	234	149	69	54	21	12	25	11	5		600	
	F	132	270	94	32	26	19	5	13	8	1			
Calhoun.....	M	2	54	24	9	2	4	3	3	1			102	
	F	49	40	4	1	4	2	2						
Clay.....	M	8	55	21	9	13	1	1	1	1	1		111	
	F	73	22	7	1	4	3				1			
Doddridge.....	M	5	35	31	6	7	2	1	2	2			91	
	F	31	39	11	4	4	1			1				
Fayette.....	M	25	183	131	50	36	25	12	19	2	1		484	
	F	181	178	48	21	20	12	12	10	2				
Gilmer.....	M	10	36	17	7	4	2	2	2	1			81	
	F	30	34	9	5		1	1						
Grant.....	M	1	16	10	1	4			2		1		35	
	F	11	12	7	2	2					1			
Greenbrier.....	M	9	80	49	23	15	5	10	6	4			201	
	F	64	84	23	11	9	3	5	2					
Hampshire.....	M	3	19	8	1	1		1	1		1		35	
	F	14	12	5	1		2							
Hancock.....	M	5	195	80	37	24	13	5	4	1			364	
	F	56	224	46	13	11	7	4	3					
Hardy.....	M	1	14	15	5	4	1	1	2	1			44	
	F	12	22	6		2		1						
Harrison.....	M	14	265	170	73	49	20	21	11	11	1		635	
	F	150	283	108	29	26	16	11	10	2				
Jackson.....	M	6	64	28	17	4	1	2	4	1	2		129	
	F	40	64	10	4	3	3	2	2	1				
Jefferson.....	M	1	62	22	17	11	9	3	8	4			137	
	F	19	64	22	13	5	5	6	2	1				
Kanawha.....	M	72	685	412	175	146	65	47	32	16	4	1	1,655	
	F	512	684	197	107	68	35	22	24	5		1		
Lewis.....	M	4	54	45	15	11	7	5	2	2			145	
	F	33	68	26	7	7	2	1						
Lincoln.....	M	17	67	41	10	5	4	3	8	7	1		163	
	F	92	41	12	2	3	3	2	3	4	1			
Logan.....	M	20	241	125	60	51	20	11	17	3	2		550	
	F	204	191	76	31	23	9	7	8	1				
McDowell.....	M	33	397	210	89	72	31	22	21	8			883	
	F	263	416	98	30	42	17	10	6		1			
Marion.....	M	14	185	146	64	45	19	17	11	6			507	
	F	123	225	62	41	28	12	9	7					
Marshall.....	M	11	116	44	21	21	6	6	11	5	3		244	
	F	68	108	24	13	12	4	5	9	1				
Mason.....	M	7	77	32	10	13	9	7	5	1	2		163	
	F	56	64	16	2	12	7	3	1	2				
Mercer.....	M	17	314	173	73	42	29	16	18	4	2		688	
	F	188	309	101	44	24	10	8	4					
Mineral.....	M	2	43	31	19	8	5	4	3	2	1		118	
	F	24	54	15	13	4	1	5						
Mingo.....	M	18	188	96	45	32	16	14	5	3			417	
	F	137	163	51	27	20	9	7	3					
Monongalia.....	M	17	122	84	41	34	13	12	6	1	1		331	
	F	96	141	51	16	15	3	5	3	1				
Monroe.....	M	6	33	29	8	7	6	7	3	2			101	
	F	34	31	16	10	3	3			1				
Morgan.....	M	3	27	18	3	4		1	4	2	1		63	
	F	20	25	6	5	1	2	1	1	2				
Nicholas.....	M	10	90	44	24	16	5	6	7		1		203	
	F	84	79	20	8	4	2	3	2	1				
Ohio.....	M	21	651	400	217	132	67	38	37	11	3		1,577	
	F	197	836	262	124	69	42	25	17	5				
Pendleton.....	M	2	24	21	3	3	3	2	1				59	
	F	15	23	11	6	2	1	1						

TABLE XV—Continued

Number Married in Each County in 1921, Classified by Sex and Age Groups

COUNTIES		YEARS											Total
		Under 20	From 20-24	From 25-29	From 30-34	From 35-39	From 40-44	From 45-49	From 50-59	From 60-69	From 70-79	80 and Over	
Pleasants.....	M	6	45	20	11	6	4	2	2	3	2	.....	101
	F	30	44	15	3	.....	3	1	3	2	.....	.....	.....
Pocahontas.....	M	3	24	17	4	5	4	2	1	1	.....	.....	61
	F	26	22	6	3	1	2	.....	1	.....	.....	.....	.....
Preston.....	M	6	59	33	14	7	4	2	5	2	1	.....	133
	F	34	62	18	7	4	2	2	3	1	.....	.....	.....
Putnam.....	M	12	66	31	5	4	1	1	4	1	2	.....	127
	F	56	41	18	3	5	.....	1	2	.....	.....	.....	.....
Raleigh.....	M	22	223	149	48	28	21	9	9	1	1	.....	511
	F	204	197	64	15	15	9	4	2	1	.....	.....	.....
Randolph.....	M	11	81	51	21	24	5	4	4	2	2	.....	206
	F	68	85	30	11	4	2	1	3	2	.....	.....	.....
Ritchie.....	M	7	57	29	12	4	7	1	7	2	.....	.....	126
	F	42	52	16	5	4	1	2	4	.....	.....	.....	.....
Roane.....	M	10	73	48	20	2	3	4	1	2	.....	.....	163
	F	62	78	14	4	1	1	1	.....	1	1	.....	.....
Summers.....	M	8	94	44	14	10	8	7	9	2	1	.....	197
	F	59	82	24	12	8	2	3	4	3	.....	.....	.....
Taylor.....	M	14	53	25	11	12	6	6	6	3	.....	.....	136
	F	36	53	26	8	4	2	3	3	1	.....	.....	.....
Tucker.....	M	6	39	38	18	8	3	2	5	.....	.....	.....	119
	F	45	40	16	6	7	2	1	2	.....	.....	.....	.....
Tyler.....	M	7	46	22	9	1	3	3	1	4	1	.....	97
	F	34	44	7	1	1	5	1	2	1	1	.....	.....
Upshur.....	M	5	87	31	20	7	5	6	5	3	1	.....	170
	F	73	63	11	5	7	5	2	3	1	.....	.....	.....
Wayne.....	M	17	47	17	7	4	3	2	4	2	1	.....	104
	F	59	24	8	6	1	.....	3	1	2	.....	.....	.....
Webster.....	M	5	49	18	3	4	3	3	1	2	.....	.....	88
	F	47	20	9	4	4	3	1	.....	.....	.....	.....	.....
Wetzel.....	M	10	111	50	13	15	11	5	7	3	2	.....	227
	F	72	98	25	9	11	3	3	5	1	.....	.....	.....
Wirt.....	M	4	16	9	8	3	.....	1	.....	.....	1	.....	42
	F	17	19	2	1	1	1	.....	.....	1	.....	.....	.....
Wood.....	M	27	211	162	69	40	32	22	25	10	.....	.....	598
	F	118	269	83	49	33	16	18	10	2	.....	.....	.....
Wyoming.....	M	8	70	39	17	4	3	3	5	1	.....	.....	150
	F	71	51	16	3	6	1	1	1	.....	.....	.....	.....
Total.....	M	622	7,961	4,166	1,755	1,196	613	425	433	176	53	1	17,401
	F	4,539	8,359	2,092	882	656	353	237	209	65	8	1	17,401

## REPORT OF STATE HYGIENIC LABORATORY.

Dr. Chas. E. Gabel, Director.

November 2, 1922.

Dr. W. T. Henshaw,  
State Commissioner of Health,  
Charleston, W. Va.

Dear Sir:

I have the honor to submit herewith the annual report of the State Hygienic Laboratory for the year ending, May 31, 1922.

Table 1 below shows that 1,868 more specimens were examined than in the previous year. Fewer Wassermann tests were made, but more typhoid, tuberculosis, diphtheria, gonorrhea, water and chemical examinations than in the previous year. Table 2 shows the number of outfits sent to physicians. Although some do not use our outfits but improvise their own, the table shows that 540 more outfits were sent out than the number of specimens received.

	Outfits Sent	Specimens Received.
	Out.	
Typhoid .....	427	326
Tuberculosis .....	1,144	972
Diphtheria .....	1,952	832
Gonorrhea .....	632	590
Wassermann .....	3,131	3,678
Water .....	3,506	4,282
		<hr/>
		10,680

If we assign an average commercial value of Two (\$2.00) dollars for each of the above examinations they alone would represent a value of more than double the amount of the appropriation which the laboratory receives per year. However, most of this work is done free of charge in order to protect and promote the health of the residents of the state. Fees are charged for examination of conditions for which the patient rather than the public is responsible. But even here, as in the Wassermann test, less than half of the cases are paid for. All work is done free for the Veterans' Bureau.

Table 3 shows the number of positive and negative results obtained from venereal examinations made this year.

We have reduced the size of outfits for getting diphtheria specimens and provided outfits for blood cultures for the early detection of typhoid infections. These contain either bouillon vials or vacuum tubes with ox bile medium. It has been shown that a patient may have sugar in the urine due to a kidney permeable to sugar and not have diabetes mellitus. This is more accurately determined by finding a hyperglycemia. For this purpose we now keep on hand outfits containing Keidal bulbs with picric acid solution for obtaining blood for sugar tests. The outfit containing four bottles for water examination has been changed to comply with postal regulations. Our postage bill has increased, due to the government withdrawing the franking privilege on reports of venereal tests made free of charge.

TABLE NO. 1

Examinations Made From June 1, 1921 to May 31, 1922

Tests Made	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	Total
Diagnostic:													
Typhoid....	21	38	59	47	28	10	35	33	10	10	12	23	326
Tuberculosis	75	73	60	150	88	56	85	81	74	112	63	55	972
Diphtheria..	18	24	37	152	140	212	65	16	23	110	25	10	832
Gonorrhoea..	35	25	38	52	131	31	49	43	50	45	49	42	590
Treponema..	8	8	11	7	4	4	9	5	10	4	4	5	79
Wasserman..	287	286	240	230	333	347	328	302	316	345	380	284	3,678
Miscellaneous..	14	32	33	14	20	9	14	22	8	23	10	14	213
Water.....	780	389	392	433	327	238	300	229	311	286	298	299	4,282
Chemical.....	20	19	12	11	14	20	20	15	19	21	14	37	222
Summary....	1,258	894	882	1,096	1,085	927	905	756	821	946	738	769	11,194
Total for the preceding year.....													9,326

TABLE NO. 2

Outfits Sent From State Hygienic Laboratory

	T. B.	Widal	Diph.	Slide.	Ophth.	Water	Wass.	Misc.	Total
1921									
June.....	71	28	24	52	36	346	206	6	770
July.....	73	30	51	31	59	354	259	6	863
August.....	107	68	54	84	49	332	313	.....	1,007
September.....	298	112	279	56	81	340	312	8	1,486
October.....	68	24	600	71	30	348	315	.....	1,456
November.....	81	63	370	73	64	238	290	11	1,190
December.....	68	25	16	17	80	178	232	2	618
1922									
January.....	52	12	30	21	204	268	278	6	871
February.....	89	4	234	64	36	270	202	10	909
March.....	118	61	281	53	80	231	229	10	1,063
April.....	48	.....	13	66	.....	241	143	.....	511
May.....	71	.....	.....	44	164	360	351	.....	990
Total.....	1,144	427	1,952	632	883	3,506	3,131	59	11,734

TABLE NO. 3

Examinations Made at the West Virginia State Hygienic Laboratory

		WASSERMANN'S		Smears for Gonococci
		Blood	Spinal Fluid	
1922				
January.....	Positive	85	0	30
	Negative	210	0	13
February.....	Positive	89	0	38
	Negative	225	1	12
March.....	Positive	95	0	40
	Negative	250	2	5
April.....	Positive	42	0	47
	Negative	235	0	2
May.....	Positive	80	0	34
	Negative	204	2	8
June.....	Positive	117	0	45
	Negative	222	0	8

In the above table two, three and four plus Wassermann's are called Positive, all others are classed as Negative. During the first six months of 1922 there were accordingly 1,854 Wassermann tests made on blood, of which 508 were positive and 1,346 negative. The percentage of positive results was 27. The total number of tests made on Spinal Fluid was 5, or only about 27 hundredths of 1 percent of the blood tests. Many more specimens of spinal fluid should have been sent in to be tested. Of the 282 smears examined for Gonococci, 234, or 83 percent were positive.

In conclusion, we wish to say that, whereas the amount of work has greatly increased in the last four years, the size of the laboratory has remained the same. It is too crowded to get best results, larger and more sanitary quarters should be provided. To do this a bigger appropriation will be necessary.

Respectfully submitted,

C. E. GABEL, Director.

November 21, 1922.

Dr. W. T. Henshaw,  
Commissioner of Health,  
Charleston, West Va.

Sir:

I have the honor to submit the following report relative to the activities of the Division of Preventable diseases for the fiscal year, ending June 30, 1922.

*Personnel of Division:*

Director of Division.

1 Clerk-Stenographer.

The work of this Division has been carried on since November 20, 1921, under the direction of an officer of the United States Public Health Service who has devoted his entire time to the activities of this Division. The activities of this Division can best be classified under two general heads: First, those pertaining to disease prevention and second, those pertaining to health promotion.

First: Control of Preventable Diseases:

(a) Collection and analysis of Morbidity Reports.

(b) Investigating and studying unusual outbreaks of communicable diseases.

(c) Assisting local health organizations in combat and prevention of commercial diseases.

(Botulinus.

(d) Special Investigations (Food Poisoning.

(Trachoma.

(Tuberculosis.

(e) Special Studies (Public Health Administration.

(a) During the past year the following contagious diseases have been reported to the Department from the respective counties as follows:

(See Table.)

(b) During the year the following epidemiological work was performed in the respective communities, together with the inauguration of ways and means for the suppression and control of the spread of disease.

Disease.	Vehicle of Infection.	Location.
Typhoid Fever	Water	Affinity, W. Va.
Typhoid Fever	Water	Huntington, W. Va.
Typhoid Fever	Contact	Little Birch, W. Va.
Typhoid Fever	Contact	Copley, W. Va.
Typhoid Fever	Water	Weirton, W. Va.
Typhoid Fever	Water	Matewan, W. Va.
Smallpox	Contact	McMechen, W. Va.
Smallpox	Contact	Fairmont, W. Va.
Smallpox	Contact	Weston, W. Va.

Smallpox	Contact	Logan, W. Va.
Trachoma	Diagnosis	Bluefield, W. Va.
Trachoma (3 times)	Diagnosis	State Pen., Moundsville, W.
Trachoma	Diagnosis	Point Pleasant, W. Va.
Trachoma	Diagnosis	Parkersburg, W. Va.
Food Poisoning	Botulism (Canned Pumpk	Parkersburg, W. Va.
Tuberculosis	Epidemiological Study	Fairmont, W. Va.
Tuberculosis	Epidemiological Study	Wheeling, W. Va.
Diphtheria	Milk	Kingwood, W. Va.

The most striking epidemiological study was that of a milk borne outbreak of diphtheria with twenty-nine cases traceable to a common milk supply. The character of the outbreak was as follows:

1. High incidence among milk drinkers.
2. Explosiveness of outbreak.
3. Two cases occurring simultaneously in the same household.
4. Age group distribution indicating a concentration of the infection in order to break down immunity.
5. Seasonal occurrence (summer months) organisms multiply rapidly in milk in warm weather.
6. Geographical distribution of cases corresponding to the geographical distribution of suspected milk supply.
7. Case rate among the customers of suspected milk supply for above average out of all proportion to the total.

Further investigation uncovered the fact that two cases of diphtheria existed on the premises of the suspected milk supply. One occurred two months and the other occurred two weeks before the explosive outbreak. In both cases antitoxin was used but no report was made in one and the other was reported from a different locality in the county. Further study showed that four of the ten persons on these premises were carriers of the disease. Two, directly engaged in the handling of the milk, and the other two indirectly.

Following the establishment of the following recommendations, the epidemic subsided.

First. That all persons found to be carriers of diphtheria organisms are to be excluded from engaging in the production, handling or distribution of milk and milk products.

Second. That after two negative throat cultures are obtained, at an interval of 24 hours each, such individuals may engage in the handling and distribution of milk.

Third. That cultures for release from quarantine or isolation and for the purpose of granting permission to persons to engage in the handling of milk or milk products must be found free from the infection as a result of the examination of specimens at the State Hygienic Laboratory.

Fourth. That all milk containers, utensils and equipment used in the handling, bottling and distribution of milk be sterilized in water heated to a temperature of 212 degrees "F."

Fifth. That a regulation be passed by the town of Kingwood requiring all milk offered for sale in the town of Kingwood to be pas-

teurized by heating to a temperature of 145 degrees "F" and held at that temperature of 30 minutes.

Sixth. That all persons found to be carriers of diphtheria be prohibited from attending any public gathering and, further, that school children known to be carriers of diphtheria be excluded from schools until two negative cultures are obtained at an interval of 24 hours each.

Seventh. That persons known to be harboring diphtheria organisms be provided with individual towels and mess gear.

#### Special Studies:

During the year a tuberculosis survey of Ohio County was inaugurated under the direction of this Division covering a period of four months. During this time the following are a few facts that were ascertained:

1. The control of tuberculosis in Ohio County is one of the most important public health problems.

2. That the reported cases are not indicative of the number existing as in 1921 there were 53 deaths registered with but 14 cases reported.

3. The findings in the fourth ward of the city of Wheelings, an area comparable to the city as a whole, showed that 1 percent of the population was tubercular.

4. The actual number of active cases listed and diagnosed as positive was 315, while 335 cases were diagnosed as suspects.

5. The need for the establishment of a local tuberculosis sanatorium was demonstrated.

6. That co-ordination of the public health agencies in this area is imperative.

(e) A study of the Public Health Administration of the City of Wheeling was made which necessitated, making the following recommendations:

1. That the Commissioner of Health be required to devote his full time to his duties; that his tenure of office depend on efficiency, and that he be required to perform, in addition to the administration work of the Department, the epidemiological investigation in the control of communicable diseases, and that he be paid a salary commensurable with his giving his entire time.

- (a) That automobile transportation be furnished the Commissioner.

2. That a stenographer and typist be employed to assist the clerk in office routine.

3. That all milk sold in the city of Wheeling, except certified milk, be pasteurized.

4. That a regulation prohibiting the selling of open or dipped milk be amended so as to include butter milk.

5. That in order to prevent the spread of communicable diseases, including tuberculosis and carry on child welfare work, the present nursing force be immediately increased to seven.

6. That the sanitary inspectors be reduced to three men, two to continue on milk and food and one to have the general duties of a sanitary inspector.



7. That the co-operation of the police department be obtained to investigate nuisances and to issue the necessary order to abate same.

8. That the Health Department administer anti-typhoid vaccine free of charge to those making application.

9. That in the case of diphtheria, cultures be taken from all contacts, including pupils of the public or other schools where necessary, and that two negative cultures be taken not less than 24 hours apart before a patient is released from quarantine.

10. That the ordinance providing for the storing and disposal of stable manure be enforced.

11. That the City Health Department carry on anti-tuberculosis work, that has been inaugurated by the Ohio County Tuberculosis Survey.

12. That the health supervisors of schools now under the control of the Board of Education be taken over by the Health Department as soon as practicable.

13. That the nurses employed by the Red Cross, Associated Charities and Ohio County Tuberculosis Association be made a part of the City Health Department nursing staff with one supervisor and ten field nurses; that each nurse be assigned to a ward and be required to do all the public health nursing duties.

14. That the educational work of the Health Department be extended.

15. That special effort be made on the part of the physicians and others to report promptly all cases of communicable disease, births and deaths.

16. That 5 percent of the available resources of the city be appropriated for the purpose of public health and sanitation; 5 percent for the Health Department, and 10 percent for the Department of Service, the latter to be used in the collection of garbage, ashes and rubbish.

17. That all persons engaged in the handling, storing, preparing, serving and cooking of food products be given a physical examination each month by the Commissioner of Health, or a physician designated by him, and when such persons are found free from communicable disease, be given a certificate over the signature of the Commissioner of Health to this effect, and said certificate to be satisfactory evidence that such persons are free from communicable disease, and shall be permitted to engage in the handling and serving of foods in accordance with Section 81 of the Food Ordinance.

18. That a system of meat inspection be inaugurated under the immediate supervision of the veterinarian.

19. That the Commissioner of Health be not required to furnish professional services at the city jail, and the present arrangement of county district physicians be continued.

20. That the Isolation Hospital be put in repair and in sanitary condition, and used for isolation of all communicable disease that cannot be properly isolated at home.

21. That a tuberculosis sanatorium with a bed capacity of 80 beds be established jointly by the city of Wheeling and Ohio County.

22. That the insanitary premises in the Fourth Ward and any others in the city be eliminated where sewer connections are available, or a sanitary privy be instituted, the type of privy to be approved by the State Department of Health.

23. That the sealing of weights and measures now being performed by the sanitary inspector be taken over by the Police Department.

24. Recommend that the Second Council Chamber be converted into office rooms and laboratory.

25. That the position of bacteriologist be made a full-time position at a compensation of \$2,500 per annum and that he be required to perform the daily examinations of water supply of the city, the bacteriological and chemical analysis of milk, the examination of samples submitted in suspected cases of typhoid fever, diphtheria, tuberculosis, gonorrhea, syphilis and such other examinations as may be necessary to detect carriers, or to determine the release from quarantine.

**Development of Adequate Local Public Health Organizations:**

- a. Supervision of Full-time County Health Units.
- b. Development of Full-time County Health Units.
- c. Development of Municipal Public Health Administration.
- d. Encouraging the Governmental Bodies to assume their responsibility in the Protection of the Public Health.
- e. Co-ordinating the Public Health Activities for Extra-Governmental Agencies in the local health departments.

**Full-time Health Program Presented to the Following Bodies:**

Conferences of County and Municipal Health Officers.

Berkeley County Court, Berkeley County.

Martinsburg City Council, Martinsburg.

City Council, Wheeling.

County Court, Preston County.

Tax Reduction Committee, Preston County.

Public Health Committee, Preston County.

Monongalia County Court.

Marion County Court.

Chamber of Commerce, Grafton, W. Va.

Marshall County Court.

Marshall County Medical Society.

Hancock County Court.

Ohio County Commissioners.

Cabell County Court.

Cabell County Medical Society.

City Council, Huntington, W. Va.

Mercer County Court.

Mercer County Medical Society.

Raleigh County Court.

Raleigh County Medical Society.

Beckley Chamber of Commerce.

Federated Farm Bureau, Morgantown.

County Superintendents of Education.

**Supervisor of Full-time Health Units:**

**Greenbrier County**—The co-operative work in Greenbrier County has been temporarily discontinued. The State Department of Health has withdrawn the financial support for the period of April 1st to June 30, 1922. Consequently, the co-operative funds of the International Health Board are likewise withdrawn. This action was taken because the director of the Unit, during this period, has not been giving his whole time to the work of the county health unit, but has been engaged in the private practice of his profession, which has been contrary to the advice from this office.

**Logan County**—The Logan County Unit has been making good progress under the circumstances, as the director was handicapped on account of insufficient personnel at the time the unit was established. The director of the unit has been devoting a great deal of time to providing a safe method of sewage disposal at the schools throughout the county and it is believed by the beginning of the scholastic year in the fall every school in Logan County will have a safe method of sewage disposal.

**Mingo County**—The results in Mingo County has been most gratifying to this Department. The director has been carrying on a well-balanced health program. Assistance has been rendered to this unit during a recent outbreak of typhoid fever at Matewan, W. Va. Following this an intensive campaign for the proper disposal of sewage at the unsewered homes was inaugurated, resulting in the installation of 30 concrete septic tanks at unsewered homes.

**Monongalia County**—This Unit has been supported jointly by the International Health Board and the State Department of Health during the months of April, May and June. No financial assistance has been received from the county authorities. A demonstration of public health activities was carried on during this period with special emphasis being laid on proper disposal of sewage, safeguarding water supply, safeguarding production and distribution of milk supplies and medical inspection of school children. This demonstration has been made for the purpose of presenting accurate information and demonstrable results to the governmental bodies in order that they might assume the responsibility of carrying on a full-time health program.

**Central Administration**—This office has been engaged in the supervision of the co-operative units and has carried on an intensive study of public health administration in the city of Wheeling and Ohio County, which resulted in a full-time health department for the city of Wheeling.

A great deal of time has been spent by the State Director in presenting to medical societies, civic organizations and governmental bodies plans for whole-time health organizations and bringing this intelligence to the attention of the governmental bodies, so that, provision could be made for the necessary appropriation to carry on this work.

The following counties—Hancock, Preston and Fayette—have signified their intention to go on a whole-time health basis November 1, 1922.

The following counties—Cabell, Kanawha, Mercer, Marion, McDowell, Taylor, Raleigh, Marshall and Harrison—have the whole-time health program under advisement.

**Recommendations:**

1. It is respectfully recommended that the sum of eleven thousand dollars (\$11,000.00) be made available annually for the prosecution of duties of the Division of Preventable Diseases.

2. That provision be made for an assistant director of the Division of Preventable Diseases who will have direct supervision over the Bureau of Rural Hygiene and assist in the study and investigation of communicable diseases.

3. That the sum of five thousand dollars (\$5,000.00) be provided for the administration of the Bureau of Rural Hygiene and the sum of twenty-five thousand dollars (\$25,000.00) be made available annually to co-operate and aid the respective counties in the state in maintaining a full-time health unit to meet the Public Health needs.

4. That a bill be introduced at the coming legislature to provide for full-time county health organization.

5. That the following regulation be passed:

Section 1. It shall be the duty of the manager of managers, superintendents or persons in charge of every hospital, institution or dispensary, in the State of West Virginia to report to the local health authority having jurisdiction in writing the full name, age and address of every occupant or inmate thereof or person treated therein, affected with any one of the infectious diseases, included in the following list, with the name of the disease, within twenty-four hours after the time when the case is diagnosed, and it shall be the duty of every physician in the State to make a similar report to the local health officer within the same period relative to any person found by such physician to be affected with any one of the infectious diseases, stating in each instance the name of the disease: Acute anterior poliomyelitis, (infantile paralysis), anthrax, Asiatic cholera, diphtheria (croup), dysentery (epidemic), epidemic cerebro-spinal meningitis, glanders, suppurative conjunctivitis, hook-worm disease, leprosy, malarial fever, measles, mumps, paratyphoid fever, plague, pulmonary tuberculosis, acute lobar pneumonia, influenza, rabies, rubella (German measles, rotheln), scarlet fever, epidemic sore throat, smallpox, tetanus, trachoma, trichinosis, tuberculosis meningitis, typhoid fever, typhus fever, varicella (chickenpox), whooping cough and yellow fever. Provided, that if the disease is typhoid fever, scarlet fever, diphtheria, epidemic dysentery, or epidemic septic sore throat, every such report shall also show whether the patient has been, or any member of the household in which the patient resides is engaged or employed in the handling of milk, cream, butter or other dairy products for sale or preliminary to sale.

Section 2. When no physician is in attendance, it shall be the duty of every person having knowledge of any person affected with any disease, apparently or presumably infectious, to at once report to the local health authority, having jurisdiction, all facts in relation to the illness and physical condition of any such person.

## TOTALS FOR THE YEAR JUNE 30, 1921 TO JULY 1, 1922

Thypoid Fever.....	1,777
Tuberculosis.....	584
Smallpox.....	631
Measles.....	1,420
Diphtheria.....	3,891
Influenza.....	6,070
Scarlet Fever.....	2,090

## DIPHTHERIA

June 30, 1921 to July 1, 1922

Barbour.....	50	Mingo.....	53
Berkeley.....	51	Monongalia.....	148
Boone.....	25	Monroe.....	55
Braxton.....	136	Morgan.....	3
Brooke.....	76	Nicholas.....	83
Cabell.....	149	Ohio.....	227
Calhoun.....		Pendleton.....	13
Clay.....	13	Pleasants.....	31
Doddridge.....	5	Pocahontas.....	31
Fayette.....	178	Preston.....	64
Gilmer.....	13	Putnam.....	22
Grant.....	1	Raleigh.....	83
Greenbrier.....	24	Randolph.....	250
Hampshire.....	4	Ritchie.....	28
Hancock.....	18	Roane.....	49
Hardy.....	1	Summers.....	22
Harrison.....	233	Taylor.....	68
Jackson.....	89	Tucker.....	16
Jefferson.....	67	Tyler.....	6
Kanawha.....	274	Upshur.....	21
Lewis.....	68	Wayne.....	16
Lincoln.....	9	Webster.....	16
Logan.....	24	Wetzel.....	6
McDowell.....	93	Wirt.....	19
Marion.....	234	Wood.....	208
Marshall.....	105	Wyoming.....	11
Mason.....	28		
Mercer.....	254	Total.....	3,891
Mineral.....	101		

## INFLUENZA

June 30, 1921 to July 1, 1922

Barbour.....		Mingo.....	29
Berkeley.....	128	Monongalia.....	23
Boone.....	3	Monroe.....	264
Braxton.....	91	Morgan.....	5
Brooke.....	17	Nicholas.....	69
Cabell.....	258	Ohio.....	1
Calhoun.....		Pendleton.....	52
Clay.....	10	Pleasants.....	
Doddridge.....	48	Pocahontas.....	
Fayette.....	411	Preston.....	107
Gilmer.....	312	Putnam.....	33
Grant.....	47	Raleigh.....	94
Greenbrier.....	23	Randolph.....	69
Hampshire.....	361	Ritchie.....	18
Hancock.....	199	Roane.....	68
Hardy.....	9	Summers.....	24
Harrison.....	556	Taylor.....	158
Jackson.....	186	Tucker.....	70
Jefferson.....	55	Tyler.....	30
Kanawha.....	489	Upshur.....	81
Lewis.....	5	Wayne.....	52
Lincoln.....	42	Webster.....	197
Logan.....	35	Wetzel.....	57
McDowell.....	8	Wirt.....	254
Marion.....	224	Wood.....	
Marshall.....	54	Wyoming.....	99
Mason.....	54		
Mercer.....	516	Total.....	60.78
Mineral.....	65		

## MEASLES

June 30, 1921 to July 1, 1922

Barbour.....		Mingo.....	159
Berkeley.....	268	Monongalia.....	11
Boone.....	8	Monroe.....	
Braxton.....	6	Morgan.....	
Brooke.....		Nicholas.....	
Cabell.....	14	Ohio.....	89
Calhoun.....		Pendleton.....	1
Clay.....		Pleasants.....	
Doddridge.....		Pocahontas.....	4
Fayette.....	182	Preston.....	4
Gilmer.....	2	Putnam.....	
Grant.....		Raleigh.....	6
Greenbrier.....	5	Randolph.....	10
Hampshire.....		Ritchie.....	
Hancock.....	7	Roane.....	
Hardy.....		Summers.....	17
Harrison.....		Taylor.....	8
Jackson.....	10	Tucker.....	
Jefferson.....	28	Tyler.....	
Kanawha.....	26	Upshur.....	10
Lewis.....	9	Wayne.....	
Lincoln.....	2	Webster.....	12
Logan.....	39	Wetzel.....	1
McDowell.....	335	Wirt.....	6
Marion.....	42	Wood.....	1
Marshall.....	137	Wyoming.....	8
Mason.....	1		
Mercer.....	20	Total.....	1,433
Mineral.....	2		

## SCARLET FEVER

June 30, 1921 to July 1, 1922

Barbour.....	25	Mingo.....	12
Berkeley.....	42	Monongalia.....	77
Boone.....	5	Monroe.....	26
Braxton.....	37	Morgan.....	13
Brooke.....	67	Nicholas.....	63
Cabell.....	47	Ohio.....	164
Calhoun.....		Pendleton.....	25
Clay.....	6	Pleasants.....	3
Doddridge.....	9	Pocahontas.....	3
Fayette.....	125	Preston.....	71
Gilmer.....	11	Putnam.....	6
Grant.....	13	Raleigh.....	13
Greenbrier.....	72	Randolph.....	29
Hampshire.....	40	Ritchie.....	1
Hancock.....	37	Roane.....	51
Hardy.....	17	Summers.....	18
Harrison.....	142	Taylor.....	44
Jackson.....	41	Tucker.....	7
Jefferson.....	38	Tyler.....	1
Kanawha.....	90	Upshur.....	13
Lewis.....	21	Wayne.....	2
Lincoln.....	2	Webster.....	5
Logan.....	15	Wetzel.....	1
McDowell.....	28	Wirt.....	14
Marion.....	157	Wood.....	89
Marshall.....	147	Wyoming.....	2
Mason.....	24		
Mercer.....	85	Total.....	20,95
Mineral.....	44		

## SMALLPOX

June 30, 1921 to July 1, 1922

Barbour.....	1	Mingo.....	6
Berkeley.....	1	Monongalia.....	7
Boone.....	2	Monroe.....	..
Braxton.....	49	Morgan.....	..
Braxton.....	49	Morgan.....	..
Brooke.....	3	Nicholas.....	44
Cabell.....	3	Ohio.....	1
Calhoun.....	..	Pendleton.....	4
Clay.....	8	Pleasants.....	..
Doddridge.....	..	Pocahontas.....	3
Fayette.....	38	Preston.....	2
Gilmer.....	10	Putnam.....	..
Grant.....	7	Raleigh.....	23
Greenbrier.....	..	Randolph.....	..
Hampshire.....	1	Ritchie.....	7
Hancock.....	13	Roane.....	2
Hardy.....	..	Summers.....	2
Harrison.....	8	Taylor.....	4
Jackson.....	1	Tucker.....	..
Jefferson.....	1	Tyler.....	..
Kanawha.....	26	Upshur.....	2
Lewis.....	14	Wayne.....	..
Lincoln.....	8	Webster.....	..
Logan.....	47	Wetzel.....	2
McDowell.....	75	Wirt.....	..
Marion.....	20	Wood.....	33
Marshall.....	..	Wyoming.....	1)
Mason.....	..		
Mercer.....	103	Total.....	311
Mineral.....	2		

## TYPHOID FEVER

June 30, 1921 to July 1, 1922

Barbour.....	18	Mingo.....	56
Berkeley.....	42	Monongalia.....	44
Boone.....	7	Monroe.....	35
Braxton.....	48	Morgan.....	9
Brooke.....	21	Nicholas.....	20
Cabell.....	61	Ohio.....	11
Calhoun.....	5	Pendleton.....	28
Clay.....	9	Pleasants.....	4
Doddridge.....	21	Pocahontas.....	12
Fayette.....	94	Preston.....	51
Gilmer.....	40	Putnam.....	14
Grant.....	11	Raleigh.....	101
Greenbrier.....	28	Randolph.....	57
Hampshire.....	30	Ritchie.....	8
Hancock.....	7	Roane.....	45
Hardy.....	7	Summers.....	47
Harrison.....	46	Taylor.....	25
Jackson.....	8	Tucker.....	25
Jefferson.....	24	Tyler.....	18
Kanawha.....	154	Upshur.....	27
Lewis.....	38	Wayne.....	26
Lincoln.....	28	Webster.....	9
Logan.....	50	Wetzel.....	1
McDowell.....	49	Wirt.....	15
Marion.....	52	Wood.....	25
Marshall.....	26	Wyoming.....	3
Mason.....	13		
Mercer.....	61	Total.....	1,777
Mineral.....	43		

## TUBERCULOSIS

June 30, 1921 to July 1, 1922

Barbour.....	4	Mingo.....	13
Berkeley.....	4	Monongalia.....	42
Boone.....	3	Monroe.....	2
Braxton.....	6	Morgan.....	8
Brooke.....	5	Nicholas.....	230
Cabell.....	2	Ohio.....	3
Calhoun.....	2	Pendleton.....	1
Clay.....	2	Pleasants.....	97
Doddridge.....	5	Pocahontas.....	1
Fayette.....	9	Preston.....	1
Gilmer.....	1	Putnam.....	3
Grant.....	1	Raleigh.....	1
Greenbrier.....	1	Randolph.....	3
Hampshire.....	1	Ritchie.....	1
Hancock.....	1	Roane.....	12
Hardy.....	11	Summers.....	12
Harrison.....	1	Taylor.....	1
Jackson.....	4	Tucker.....	1
Jefferson.....	36	Tyler.....	1
Kanawha.....	2	Upshur.....	1
Lewis.....	2	Wayne.....	1
Lincoln.....	1	Webster.....	4
Logan.....	21	Wetzel.....	6
McDowell.....	6	Wirt.....	6
Marion.....	3	Wood.....	6
Marshall.....	6	Wyoming.....	584
Mason.....	5	Total.....	
Mercer.....			
Mineral.....			





**Annual Report of the  
DIVISION OF SANITARY ENGINEERING.**

**E. S. Tisdale, Director.**

**July, 1921—July, 1922.**

**Dr. W. T. Henshaw,  
State Health Commissioner,  
West Virginia State Department of Health,  
Charleston, West Virginia.**

**Sir:**

It gives me pleasure to submit the following report of the activities of the Sanitary Engineering Division during the seventh year of its work.

**General.**

The work of the Sanitary Engineering Division has made steady progress during the past year. Three sanitary engineers, Mr. R. C. Beckett, Mr. C. H. Young and myself, have handled the work of the division which includes investigating and controlling water borne typhoid epidemics, examining and approving new water supplies, new filtration plants and sewerage systems, together with other miscellaneous duties mentioned in the body of this report. During the three summer months of 1921 an additional man, Mr. J. M. Brewster, augmented the staff to supervise the sanitation in the 4-H camps throughout West Virginia.

Not least among the activities of this division have been the rather extensive sanitary surveys of several of the larger cities of the State which have served the purpose of stimulating city governments to action in bettering the public health. In six cities the following physical attributes of the city were reported upon in detail: 1. Public water supply; 2. Milk supply; 3. Sewerage and sewage disposal; 4. Garbage disposal; 5. Typhoid fever prevalence, and 6. Health department organization and budget. Already the remedial work along the lines suggested has been so outstanding that this type of work will continue to be followed as one of the most productive which the Engineering Division can adopt.

**Accomplishments of the Engineering Division.**

One of the most stimulating features of the work of a sanitary engineer is that he can see wide multitudes of men and women affected by a single remedial step in his field. This affords a particular pride to the man behind which perhaps compensates to a certain extent for the mediocre money payment which the public today is willing to pay for the work of a sanitary engineer. The engineer can see the grim reaper's hand about to seize upon little children, upon men and women in their most productive period of accomplishment, suddenly stopped in its death grip, by the substitution of a safe water supply for a sewage polluted one. By a single stroke, as it were, thirty or forty precious lives are saved and ten times that amount of sickness, misery and

sorrow done away with. Yes, but the spectacular, theatrical element is absent. People unacquainted with the facts cannot see in the symbol of a death rate cut in half, the actual betterment to human welfare. Let's look at a single instance.

The accomplishment of attaining success after a continuous struggle, ever since the division was formed in 1915, in regard to making provision for a safe, adequate and satisfactory public water supply for Wheeling is an illustration. The Sanitary Engineering Division does not claim the distinction of having actually made available the \$2,000,000 in money which will build a 20,000,000-gallon filtration plant for the city of Wheeling, the largest city in the State, but it has consistently and persistently fought for this goal by newspaper publicity, by personal activity in the city of all the engineers of the division and by whole-hearted co-operation with the city government which finally put over a well planned campaign and passed the bond issue for a safe public water supply.

As mentioned above, sanitary surveys have figured conspicuously in the work of the sanitary engineers during the year just passed. As Professor Whipple says in his introduction to Horwood's Public Health Surveys, "Sanitary surveys are a logical part of the present day movement to improve the health of the world. Preventive measures must be based upon facts and one of the prime objects of a sanitary survey is to reveal the weak spots and by studying all the elements of a situation to ascertain how impending dangers may be avoided by timely action." The sanitary engineers "seeing with trained eyes" have completed sanitary surveys in Bluefield, Grafton, Morgantown and Fairmont during the year just passed. Let us see what has already resulted since these detailed reports have been filed with the various city governments:

1. Bluefield has retained the services of a reliable consulting engineer to investigate and prepare plans for a comprehensive sewerage system.
2. Bluefield has taken steps to have the inadequate and impure water supply bettered by the construction of a 110,000,000-gallon reservoir and a modern water purification plant.
3. Bluefield has adopted a comprehensive milk ordinance, has taken steps to better safeguard the city milk supply and equipped a city laboratory, placing it in charge of a well trained bacteriologist.
4. Bluefield is providing for a more comprehensive and complete garbage collection service and disposal by incineration.
5. A full-time public health officer will be placed in charge of the work of the reorganized city health department.

All the above-mentioned imperative needs were brought out in the Bluefield Sanitary Survey which was filed with the city authorities during February, 1922. In Fairmont, Morgantown and Grafton progress is now being made along the lines laid down in the Sanitary Survey of these cities, but space does not permit a description of these activities.

The activity of many cities of the State to secure better and safer water supplies is worthy of mention at this time.

Huntington is enlarging the rapid sand filtration plan from four million to ten million gallons daily capacity, making provision for an ultimate daily capacity of twenty-five million gallons. The intake has been removed three miles up the Ohio River to a less polluted area, thereby obtaining a better raw water.

Parkersburg is making ready to abandon the Smith Filtration System. Investigations are being carried on to determine whether the existing plant will be revamped into a filtration system or deep wells be utilized to furnish the public water supply.

Elkins has completed and put into operation a modern rapid sand filtration plant of two million gallons daily capacity. A complete bacteriological and chemical laboratory has been equipped and the filter operator so trained that the plant may be intelligently operated at all times.

St. Albans has installed a well designed brick and concrete filtration plant to purify water from Coal River. The purification system has a daily capacity of one million gallons. The filter operators are receiving training from the sanitary engineers of this division so that proper operation will be brought about.

Logan has forwarded to the Sanitary Engineering Division complete plans for a modern water purification system. This plant will be finished in the spring of 1923, thereby substituting a safe water supply for one formerly unsafe.

Other cities are bettering the water systems but the above five cases are cited merely by way of illustration of the progress in this field. All this activity toward better and safer public water supplies must react to the welfare of West Virginia citizens. A paragraph from a recent address by the Director of the Division of Sanitary Engineering before the Central States Section of the American Water Works Association brings out clearly what this means in typhoid fever reduction.

"Talliaferro Clark of the U. S. Public Health Service in his estimate made in 1915, figured conservatively after rather careful studies, that over 7,000 cases of typhoid fever occurred annually in West Virginia. The rate today is still too high but actual figures from the Division of Vital Statistics show that in eight months of 1922, 153 people died of typhoid fever in West Virginia. In twelve months this would give 229 deaths and allowing 12 cases for each death, a figure of 2,748 is obtained as the estimated number of cases of sickness for 1922. There is a wide divergence between 2,748 and 7,000—a reduction of approximately 60 percent. The sanitary engineers feel that estimating very conservatively the typhoid death rate in West Virginia has been reduced 50 percent and the greatest reductions have been made in the cities of the State where public water supplies were polluted which now have been improved either through chlorination or filtration due, at least, in part, to the efforts of the Division of Sanitary Engineering.

In order to allow the reader of this report to easily visualize the field work of water supply investigation and reports, the increase in number of chlorinators protecting water supplies and swimming pools, a series of maps have been prepared. A glimpse at the following maps

will mean more than pages of descriptive matter. If you are interested in the exact nature of the work at some particular place, a glance at the tabulated list of towns and cities, to be found at the end of the report, will give detailed information.

#### Recommendations for Coming Two-Year Period.

West Virginia has been hampered in developing and her growth retarded by the comparative isolation of one part of the State from another. It is difficult to travel quickly from one section of West Virginia to another adjoining one, due to intervening mountain ranges or unimproved roads which are impassable. These same points hinder the Division of Sanitary Engineering from working most effectively. Therefore, the Director would like to make one recommendation, in particular, which he hopes may be carried into fulfillment in the coming two-year period.

Maintaining the central office of the division at Charleston as at present, I feel that it would be economical to establish also a branch office in both the northern part of the State, say at Fairmont, and in the southern part of the State, for instance, in Bluefield. It is a physical impossibility for three engineers located at Charleston to keep in touch with cities and towns in 55 counties in West Virginia. We find often that proposed improvements in both the field of water supply and sewage disposal are carried through before we are aware of the changes. The law requires that all the proposed improvements be filed with the State Health Department and the plans carefully checked, yet we are unable to carry out the provisions of the law. I think that at least two branch offices should be established and feel that this could be done at a nominal expense. Full-time public health units are to be functioning in Fairmont and Bluefield in 1923 and no doubt rent could be cut down materially by a joint sharing of offices provided this seemed wise after investigation.

Many thousands of dollars could have been saved the City of Fairmont during 1922 had a sanitary engineer been available there to advise the city on certain perplexing features of the public water supply. When the engineers later visiting Fairmont for another purpose did discover the acid condition of the city water which was corroding the pipe lines and hot water heaters of the city at a terrific rate, remedial steps were taken but much damage had already been done. This is but one example of the maxim, "A stitch in time saves nine," and resident engineers are the only real solution of the difficulty. To put this scheme into operation, one or more additional sanitary engineers should be employed.

It is earnestly recommended that the present practice of employing a man during the three summer months to co-operate with the Agricultural Extension Division be continued. The work is productive of much good and is one of the few endeavors of the division to reach out and help the rural people. Roughly speaking, West Virginia is two-thirds rural and one-third urban. Is it not our duty to give some attention then to "Rural Sanitation?" I believe that the above-mentioned recommendations should be followed to enable this division to render more effective service to the citizens of West Virginia.

### WATER SUPPLIES

Agitation for better public water supplies has been general in all parts of the State during the past year. The cities of Charleston, Huntington, Clarksburg, Parkersburg, Fairmont, Grafton, Morgantown, Bluefield and Wheeling have all experienced some activity to better the public supply. As a result of a favorable bond issue vote, Wheeling, the largest city in West Virginia, will get a safe public supply for the first time in its history. Fairmont and Grafton voted down bond issues which provided money for a much needed filter plant. Clarksburg's bond issue, which included \$100,000 for additional water lines, was defeated. Nearly one-half million dollars is being spent by the Huntington water company in a new filter plant, intake, sedimentation basin and distribution mains. Bluefield's water supply will be filtered when the new four million-gallon plant and impounding reservoir are completed. Morgantown's water supply is being bettered through rehabilitation and additions to the existing filter plant.

**Wheeling, Ohio County**—The one achievement in water supply betterment accomplished this year in West Virginia is the successful flotation of a \$2,000,000 bond issue by the people of Wheeling for the construction of a modern mechanical filtration plant of 20,000,000 gallons capacity, a new pump station and five new 1,000,000-gallon capacity steel tanks to be used as reservoirs. This will give Wheeling for the first time a clean, safe, unpolluted water. Many lives and much suffering will thus be saved each year from now on due to this one act of voting favorable for the bond issue. This division by incessant repetition of the need of mechanical filtration has kept the question of pure water before Wheeling for several years. This active work through publicity matter given to the newspapers over a period of eight months with the addition of talks before various civic bodies, played a large part in winning over the people to the desirability of this new supply. Plans for the new filter plant will soon be in the hands of this division so that they may be gone over in detail with the consulting engineer before approval. It is contemplated that this purification system will be completed in the fall of 1924.

**Elkins, Randolph County**—During the winter and spring of 1922 a new two million gallon filter plant has been in process of construction and it was finally put into operation the last of July. This gives Elkins the finest equipped small filter plant in this state. Through the construction of this plant a safe water will be obtained daily and the constant occurrence of typhoid fever stopped. Plans were approved by this department on October 19th, 1921.

**Mullens, Wyoming County**—Detail water supply plans were approved for Mullens March 24th, 1922. This included the construction of wells, pump station and distribution system. Water from the deep wells is of good quality.

**Bluefield, Mercer County**—A permit was given to the Bluefield Water Works & Improvement Company on October 29th, 1921, to install two pressure filters as an emergency arrangement to filter 700,000 gallons

of water daily from Bluestone river. Wooden sedimentation basins serve to settle the water before it passes to the pressure filters.

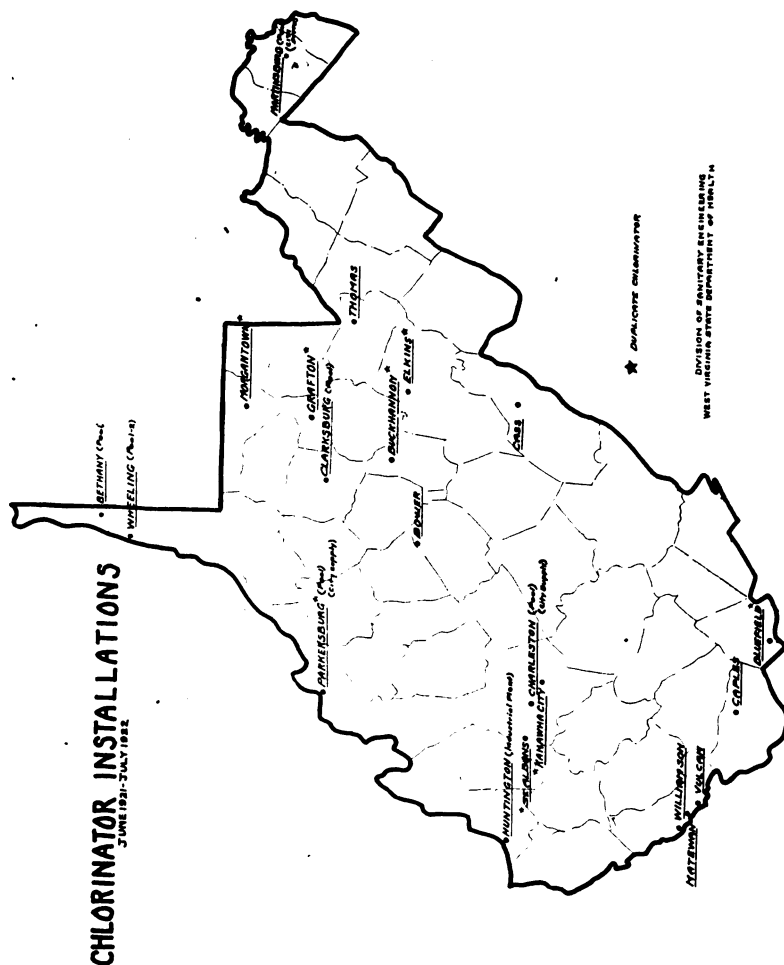
**Almina, Monogalia County**—A permit was issued July 13th, 1922, for the construction of a pumping station, distribution system and small hypochlorite disinfecting plant to be installed to furnish water to a new mining community.

**Paden City, Wetzel County**—Plans were submitted and tentatively approved February 18th, 1922, for the construction of a new water supply. Water is derived from drilled wells and piped to all parts of the town through a well designed distribution system.

**Capels, McDowell County**—Plans were submitted and approved September 14th, 1921, for extensions to an existing water system and for the installation of an iron removal and gravity filter plant.

### PROTECTION BY CHLORINATION

Considerable gain has been registered in many small towns of the state by the installation of chlorinating apparatus. Reference to the map showing Chlorinator Installation 1921-1922 shows this progress graphically. As it has been the constant endeavor of the engineers to get better operation of the filter plants in the state by personal co-operation with filter plant operators, so has it likewise been attempted to keep chlorinators operating effectively at all times. This has been done in two ways—first, by having duplicate apparatus or spare parts for the machine always ready at every place where chlorination alone is the sole safeguard; second, by training the operators to use intelligently the orthotoluidin testing kit devised and distributed by this division.





### ORTHOTOLUIDIN TESTING OUTFITS

Up to the present year chlorine had been added to the water from a more or less theoretical standpoint and as a result sufficient attention was not given to the fluctuations of the oxidizable matter in the water. The variation in the chlorine consuming content of the water due to bacteria and organic matter finding its way into surface streams has been found to be considerable. To overcome this and to make certain that the water has been thoroughly disinfected, a small kit has been devised by this department and sent to all operators of chlorinators at cost price. The kit consists of several tubes containing colored liquids which are known as "standards". An empty tube similar in capacity and height is filled with the water to which chlorine has been applied and a few drops of orthotoluidin are added. If chlorine is present the sample will become green in color. To determine just what strength of chlorine is left in the water this colored tube is compared with the "standards" whose strengths are known. A certain strength "standard" is chosen as the one desirable to match. If the sample tube shows a stronger color the chlorine dosage should be lowered. If it is weaker more chlorine should be added. The essential function of the test is to maintain at all times a greenish color of a certain hue in the sample as this denotes excess chlorine and means that all organic matter and bacteria have been oxidized and that a trace of chlorine is still present. This is in a measure a factor of safety. Over forty of these outfits have been distributed to towns, industrial corporations and to operators of swimming pools. A list of these is appended hereto:

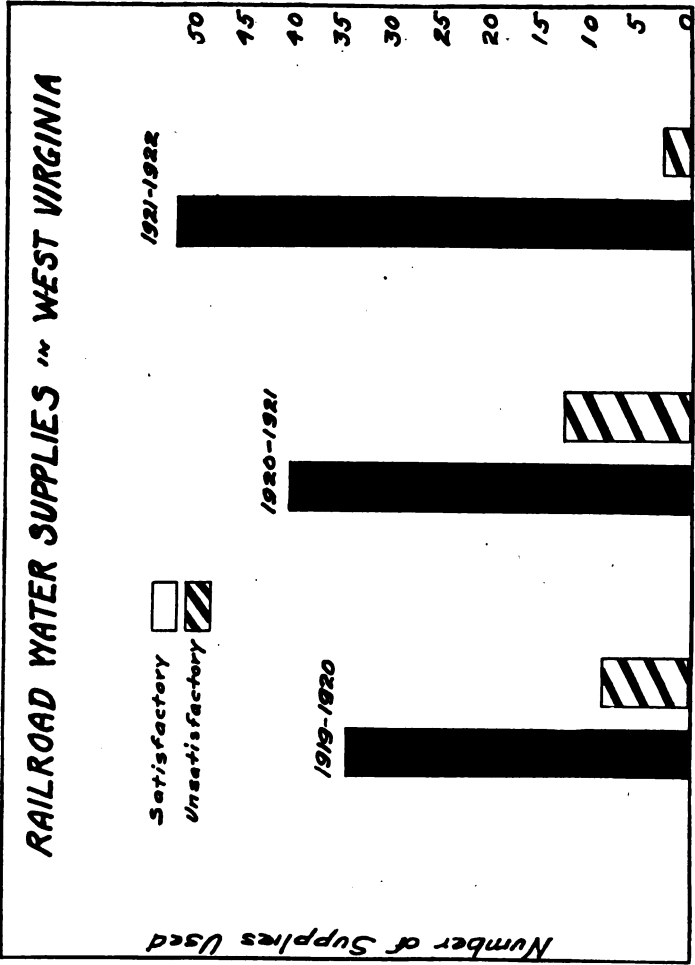
Alderson	Luna Park (Charleston)
Barboursville	Monongah
Black Betsy	Martinsburg
Bluefield	Morgantown
Bower	Norton
Burnsville	Parsons
Catlettsburg	Petersburg
Clendenin	Pratt
Cass	Philippi
Charles Town	Ronceverte
Dunbar	Richwood
Elm Grove	Rowlesburg
Elkins	Shepherdstown
Fairmont	Sistersville
Gassaway	St. Albans
Grafton	Spencer
Glen Ferris	Weston
Huntington	Wheeling
Huntington (Internation Nickel Company)	Wheeling Y. M. C. A.
	Weirton
Kingwood	White Sulphur Springs
Lewisburg	Williamson
Logan	

## RAILROAD WATER SUPPLIES USED FOR DRINKING PURPOSES

A very important but little known activity of the Division of Sanitary Engineering is its co-operation with the U. S. Public Health Service at Washington and the various railroads in West Virginia in the certification of all water supplies used by the various railroads in supplying drinking water for the passenger coaches. The fact that an unsafe supply which is used by passengers for drinking purposes may be strategically located and thus serve as the focus for widespread dissemination of typhoid fever renders careful supervision of railroad water supplies necessary.

Throughout the year water supply points have been investigated and reports made to the Federal authorities and to the railroad officials. The list of supplies visited this year are as follows: Berkeley Springs, Berwind, Bluefield, Buckhannon, Charleston, Clarksburg, Elkins, Elmore, Fairmont, Gary, Gassaway, Grafton, Hinton, Huntington, Kenova, Loch Gelly, Logan, Martinsburg, Morgantown, Mullens, Nallen, North Fork, Oak Hill, Paint Creek Junction, Princeton, Quinnimont, Rainelle, Richwood, Ravenswood, Romney, Ronceverte, Sabraton, St. Albans, Sutton, Thomas, Thurmond, Wheeling and Williamson.

The total list of railroad water supply points are listed below. A chart showing the progressive increase in the number of safe supplies as against the unsafe supplies as used by the railroads for the last three years, accompanies this report.



### RAILWAY SANITARY CODE ADOPTED

The State Department of Health has adopted a Railway Sanitary Code. The code as adopted conforms to the railway sanitary code recommended and approved by the Conference of State and Provincial Health Authorities and has the approval also of the United States Public Health Service and the American Railway Association. It has been the aim of the state, federal and railway health officials to have the Railway Sanitary Code uniform in all states because of the inter-state connection of railroads.

The Railway Sanitary Code regulates the transportation of persons having communicable diseases, the water and ice supplies for railway cars, stations, the cleaning and disinfection of cars, the sanitary condition and control of cars while in service and the sanitary conditions at railway stations and railroad construction camps.

### TYPHOID FEVER OUTBREAKS

Several severe outbreaks of water-borne typhoid fever occurred in West Virginia during the last year. The most severe outbreak was the one that occurred at Affinity, a small mining community in Fayette County where some sixty persons were stricken out of a population of 450 people. The detailed report of the method of combating this outbreak and the recommendations for improved sanitary conditions contained therein has been incorporated in this section of the annual report.

The old, old, story of permitting raw river water to enter the homes of people with the consequent sickness and death from typhoid was repeated again. However, year by year the toll from typhoid in West Virginia is being cut down. If the cities and towns can be made to see the economy of pure water, typhoid will continue to diminish, until we have it scattered chiefly in the rural districts. Here one must stage a "guerilla warfare" for it means seeking out the individual home or farm and bringing to the farm people the message of sanitation.

The money cost of this unnecessary suffering and waste of life from the onslaught of typhoid fever would save several times over the amount of money now spent on the activities of all the divisions of the State Department of Health. Can not man deliberate and plan his relationship, his battles against mankind's enemy as he plans his new home, his day's work.

## AFFINITY—RALEIGH COUNTY

### Typhoid Fever Outbreak—December 7, 1921

Affinity borders on Soak creek, a tributary to Piney creek, which in turn empties into New river. About 500 people are here engaged with the Pemberton Coal & Coke Company in the mining of coal. It is a typical mining camp as found in many sections of West Virginia. The town gives one the impression that some one had come marching up the small valley formed by the creek with an armful of little huts or houses and had thrown a portion up on the hillside, some resting on the top of the hill, some not quite reaching the top but tenaciously clinging to the sides of the hill. In the bottom of the valley lie the general store, amusement hall and coal tippie with its auxiliaries, the power house and electrical equipment. The town is reached by the Chesapeake and Ohio and Virginian railroads.

**Water Supply**—A small Permutit pressure filter was installed in 1919. The filter is four feet in diameter and five feet high with a filtering capacity of 24,000 gallons per 24 hours. A Cameron pump with a capacity of 90 gallons per minute lifts the Soak creek water to the small concrete settling tank in the building adjoining the power house but distinct from the building that houses the pressure filter. This basin is seven feet deep and 27'x15' in plan. Before entering the settling tank the chemicals—lime and alum—contained in wooden tubs holding 52 gallons of the alum solution and 47 gallons of the lime solution, are mixed with the incoming water in a wooden trough having 23 baffles at right angles to the flow of the water. This trough empties into the settling basin and is led up to the opposite end of the tank and down the other side where chlorine is applied to the effluent. A Cameron pump of 290 gallons capacity takes this effluent and forces it through the pressure filter and thence to the distribution system, the remainder going to a covered wooden reservoir on the hill with dimensions of 20'x13' and having a capacity of 37,000 gallons.

**Distribution System**—There are approximately 10,000 feet of 4-inch and 3-inch galvanized iron pipe with connections for a few private homes, numerous hydrants being available to groups of families and nine fire hydrants.

**Sewerage System**—No sewers are in existence. Three cesspools, as shown on the accompanying map, take care of the household and body wastes of the houses which have flush toilets and running water in the houses. The ordinary vault privies are used to take care of the excreta of the remaining families, one privy allotted to each family.

### TYPHOID FEVER

**Prevalence**—In response to urgent calls from Mr. W. J. Colburn, Superintendent of the Pemberton Coal & Coke Company at Affinity, W. Va., Dr. M. V. Zeigler, State Epidemiologist, went immediately to Affinity and investigated 28 cases. Forty cases of typhoid fever occurred within exactly one month, the first case being reported as a bedside case on November 5th, the second occurring on November 8th and regularly

each day with the exception of two periods, namely between November 12th and 16th and November 28th to December 1st, 1921. The cases were first reported as being typhus fever which report later was revised and the diagnosis given as influenza. This latter was subsequently overruled by the establishment of the fact that the cases were typhoid. Widal tests made at the State Hygienic Laboratory confirmed Dr. Zeigler's diagnosis. Typhoid fever occurred at various ages and with both sexes. The youngest patient, a boy, was 23 months old and the oldest, a woman, was 58 years old. The preponderance of cases occurred in the age group from 20 to 29 years, the second largest group falling between the years 30 to 39.

**Source of Infection**—An examination of the sanitary condition of the town reveals an ever present danger due to the insanitary privies in use here. The town is served by several small valleys each of which are lined with open privies. Small storms flush out these valleys periodically and carry the sewage-laden water down to the railroad tracks and then along a road leading in front of the store, power house and tipple. Two things are possible here, typhoid fever through dissemination by flies and typhoid fever by the overflow of this same sewage carried down the rivulets into Soak creek. However, the existence of typhoid fever is known to be endemic here and moreover direct knowledge is had of three cases occurring a few miles up stream on Soak creek at a small camp called Sophia. Three cases occurred in August, 1921, being those of the Crutchfield boy and Mrs. Copley and daughter. These cases were attended by Dr. W. G. Moore, company doctor for the Pemberton Coal & Coke Company at Affinity. Regardless of those known cases conditions on the watershed make it seem reasonable that there will be frequent appearance of the typhoid fever germs in the raw water supply. Pollution is also very evident from the condition of the town of Affinity itself, no means being available to successfully take care of the sewage of the town.

**Operation of Water Purification Plant**—The water purification system is certainly adequate to take care of a polluted water. But no matter how perfect a system is mechanically, if it is not operated consistently and intelligently, the people are receiving a water that is not kept safe. A bad feature of slovenly operated plants is the fact that the consumer is using the polluted water confident that the filter operator is doing his level best to provide pure water. When that chain breaks the consumer unconsciously waits until typhoid germs enter the water and later his own body through his mouth. Not until then does he realize that human sewage has been allowed to remain in his drinking water. Proper operation of the Affinity filter plant and the chlorinator should give a water of absolutely safe quality at all times. However, negligent operation of the plant has been evident.

The outbreak was attributed to the raw water from Soak creek having been permitted to enter the distribution system because of the breakdown of the chlorinator and the slovenly operated filter plant. The operator of the plant admitted that chemicals had not been added regularly in the process of purification and that the chlorinator had not been working for some time. The broken down chlorinator was immediately replaced by

an emergency chlorinator, the property of the State Department of Health. The chlorine was added at a high dosage for several days. In order that the water distribution lines might be thoroughly flushed and disinfected, all five hydrants were opened and the lines as well as the wooden reservoir, were emptied. Later the hydrants were closed and the highly chlorinated water forced through the mains. Samples of the water will be taken daily by Dr. Moore and when the analysis shows the water to be safe, notice will be sent to the authorities in Affinity to that effect.

**Emergency Measures**—Due to the scarcity of doctors and nurses prevailing in Affinity, measures were immediately taken to commandeer the motion picture hall and pool room which were housed in the same building. Fourteen cots have been provided, seven being used for the women and seven for men, divided by a beaver board wall constructed for this emergency occasion. Sufficient cooking utensils to provide for the hospital cases as well as for the distribution of food for certain cases where it is felt that proper care can not be given to the patient by the members of the household, have been obtained along with the necessary hot plates, sterilizers, electric heating and water systems necessary for proper hospitalization. Arrangements have been made to thoroughly disinfect the whole building and to provide for the disinfection of the excreta from the patients and as well as all wastes from the temporary hospital.

Three nurses from Charleston in company with Miss East, Field Supervisor with the Division of Public Health Nursing, have been placed in charge of the various cases under Dr. Moore. The company nurse, Miss Farnum, is further co-operating with the other nurses and the suppression of secondary cases through the education of the members of the family and bedside attention by the nurses, will result in keeping down materially further unnecessary spread of the disease.

**Recommendations**—1. That daily water samples be taken until the water has been deemed safe by this department.

2. That daily records be made of the amount of chemicals added to the water, the rate of application of chlorine to the water, the number of washings of the filters and that these records be submitted to the Division of Sanitary Engineering at the end of each week. The report forms to be furnished by this department. A copy of the State Laws covering the submission of these records accompanies this report.

3. That the broken down chlorinator belonging to the company be returned to the manufacturer for repairs.

4. That monthly water samples be submitted to the State Hygienic Laboratory monthly in the container sold by the laboratory at cost price, namely, \$1.00.

5. That sufficient testing apparatus be purchased to effectively determine daily the amount of alkalinity and turbidity in the creek water in order that the chemicals may be more intelligently applied to the raw water.

6. That the existing cesspools be drained, dosed with lime and filled in. That the privy vaults be removed, limed and filled in, to be replaced with sanitary chemical closets. Septic tanks either as out-

lined in submitted sketch or some other tank of satisfactory make be adopted for the homes containing flush toilets.

7. That immediate work be started on the installation of chemical closets due to the fact that the existing excreta is heavily charged with typhoid germs which present a wonderful opportunity for the transmission of this disease by flies during the coming summer season. All measures should be taken to effectively rid the community of this excreta, hauling it to a central field and there burning it.

Huntington, Cabell County—January, 1922, an outbreak of some thirty cases of typhoid fever occurred in Huntington and was spread out over a rather long period of time. An unusual number of deaths resulted from this outbreak. Suspicion was directed to certain milk supplies but the final investigation by the Division of Preventable Diseases placed the blame on the city water supply. Several flood river tides had placed a burden on the filter plant which it was incapable of satisfactorily handling. Since this outbreak and due in part to recommendations by this division, the plant capacity has been increased 100 per cent, a new laboratory installed and a million gallon sedimentation basin constructed. The plant is in process of being enlarged still further and plans for additional filter units and a new intake will be filed with the division.

Louisa Mines, Hancock County—September 23rd, 1922—Investigation of small typhoid fever outbreak due to contamination of private well. Well condemned and closed. City supply which is filtered and chlorinated recommended for use.

Bristol, Harrison County—December 14th, 1921—Several cases of typhoid fever attributable to a polluted well were investigated. Several samples of wells were taken to confirm the sanitary survey of the wells. Well at district school condemned and location of chemical toilet recommended to be changed.





## SEWAGE DISPOSAL IN WEST VIRGINIA

Considerable activity throughout the year was manifested by many cities in constructing new sewerage systems to serve the citizens of the various towns. The actual amount of construction work undertaken, the plans for which the Division of Sanitary Engineering carefully checked, is best visualized by referring to the map entitled, "Sewerage Systems." The heavy black line sets forth the mileage covered by all systems approved. It is undeniably true that a considerable additional amount of sewerage has been constructed. However, due to the limited numbers of engineers in the Division it has been impossible to keep in touch with all sewerage work going on in the state. The establishment of officers for resident engineers in the northern and southern parts of West Virginia would in great part remedy such omissions. As one of the duties of this department is to approve all construction of sewers, a considerable amount of work is done in an educational way to bring to the attention of people in unsewered towns the fundamental and physical benefits to be derived from a comprehensive system of sewerage for this or that town. Several towns during this last year have bonded themselves in order that these necessary improvements might be made.

The necessary supervision of the discharge of sewage is patent when we consider the fact that the majority of the people of the state receive their drinking water from surface supplies which water when received by the citizens, may be properly treated or may not be treated at all. With this in mind it behooves the state to see that no unnecessary danger to these supplies is created. Also science and common sense working in unison must be applied to the problems growing out of the question of the proper disposal of the human wastes of the inhabitants of West Virginia cities and towns. An effort is made to have all towns and cities feel free to call on this department for consultation and advice. In this way the public health is more properly cared for than by leaving these decisions to each individual town or city. It also serves to save money for many cities which otherwise might be squandered in poor design and neglect of the growth and expansion of the city.

A few of the important sewerage systems constructed last year will be described:

**Ceredo, Wayne County**—A comprehensive system was approved early in June, 1922. Construction started immediately. This system will comprise 13,000 feet of sewer plus manholes and appurtenances. The discharge will be in the Ohio river. The estimated cost is \$23,000.

**Hollidays Cove, Hancock County**—This industrial city has installed some 6,000 feet of a sanitary sewer designed to serve practically every home in the corporation. The outfall sewer discharges into Harmon creek.

**Madison, Boone County**—A bond issue of \$40,000 was floated for the construction of a comprehensive sewerage system to take in the entire city of Madison. Active work began July, 1921, and was completed in October, 1921. Eighteen thousand feet of sewers plus manholes and appurtenances were put in, serving about 90 per cent of the people.

The sewers discharge into Coal river and Spruce Fork. The water supply of Madison is obtained from deep wells.

**Midelburg, Logan County**—This new system of 3,100 feet sewers is a new developement south of Logan. Discharge is made into the Guyan river above the Logan Water Works intake. An agreement has been reached whereby the sewer will be carried below the water works intake.

**Mullens, Wyoming County**—Plans were received of the comprehensive sewerage system of Mullens. This consists of 29,000 feet of pipe laid in many cases through solid limestone. Discharge points are located on Salt creek and the Guyandotte river. The estimated cost was \$43,000 and the system is designed to serve 85 per cent of the people.

**Sabraton, Monongalia County**—This modern industrial town has just completed the laying of 10,000 feet of sanitary sewers serving about 95 per cent of the homes. This sewer empties into Deckers creek which flows into the Monongahela river about one mile below the intake for the city of Morgantown. Sabraton's water is obtained from Tibbs run  $4\frac{1}{2}$  miles from Sabraton.

### SANITARY SURVEYS

To give a fair conception of the amount of time and effort expended this past year on sanitary survey work in the several sections of West Virginia, one of the complete reports which covers some fifty or sixty typewritten pages should be incorporated in this annual report but the space can not be taken. Typewritten reports bound in heavy cardboard covers and appropriately titled have been filed in each case in the office of the State Health Commissioner and copies sent to the city in question. The following cities and mining towns have had a complete sanitary survey during the past year: Hamlin, Bluefield, Grafton, Fairmont, Morgantown, Sabraton, Scotts Run, Bertha Mines, Weston and Riverside.

The last five named communities all lie in Monongalia County neighboring to Morgantown. At the instance of the State Health Commissioner a study of five places and Morgantown was undertaken as communities representative of the county. One of the sanitary engineers took charge of four medical students from West Virginia University who collected a considerable amount of the data in the field with reference to wells, springs, privies, typhoid fever prevalence and housing conditions. Detail reports were prepared in the office and sent to each of the mining towns in question and a copy of the report was filed with city and county authorities and the endeavor made to create the much needed full-time health unit in that county.

The Monongalia County Survey has resulted in the following improvements:

1. The Morgantown public water supply is being bettered.
2. A comprehensive plan for sewerage in Morgantown has been provided and construction is now taking place on part of the proposed system.

The Bluefield Sanitary Survey report has resulted in the following:

1. Bluefield has retained the services of a reliable consulting engineer

to investigate and prepare plans for a comprehensive sewerage system.

2. Bluefield has taken steps to have the inadequate and impure water supply bettered by the construction of a 110,000,000 gallon reservoir and a modern water purification plant.

3. Bluefield has adopted a comprehensive milk ordinance, has taken steps to better safeguard the city milk supply and equipped a city laboratory placing it in charge of a well trained bacteriologist.

4. Bluefield is providing for a more comprehensive and complete garbage collection service and disposal by incineration.

5. A full-time public health officer will be placed in charge of the work of the re-organized city health department.

The Grafton Sanitary Survey has resulted in this change:

1. A permanent chlorinating plant has been purchased and installed by the city authorities.

2. A bond issue for filtration plant though defeated in 1922, will probably be passed in 1923.

The Fairmont Sanitary Survey has helped the city as follows:

1. Detailed plans for a four million gallon filter plant have been prepared and the question will be voted upon again in 1922 or early in 1923. It is almost certain that the bond issue will result favorably due to the wide publicity given concerning the unsafe and unsatisfactory water supply.

The recommendations made at the close of the Bluefield report have been included here as illustrating the extent and worth of this type of activity.

## SUMMARY OF RECOMMENDATIONS OF BLUEFIELD SURVEY

### Public Water Supply

1. It is advisable that close watch be kept on the quality of water being supplied to Bluefield since there are many different sources of water supply. When the new filtration plant in the railroad yards is operated there will be four different supply stations. When the springs become muddy the rate of chlorination must be raised to be effective. Then too, the filtration practice at the temporary filter plant must be varied as the Bluestone river varies. Careful operation will be required at the filter plant.

2. Since chlorination becomes more or less ineffective when the Ada and Beaver Pond Springs are muddy, it is recommended that during such periods the filter plant using Bluestone river water be operated in order that a clear, safe water supply be furnished the city. In this way only a minimum amount of the turbid spring water need be used.

3. Daily bacteriological testing of the city water should be started immediately. The equipping of a city bacteriological laboratory and the step of engaging a competent bacteriologist to perform this daily supervision of the city water should be undertaken without further delay.

### Springs and Wells

1. In view of the fact that the spring waters in Bluefield and vicinity come from cavernous limestone regions and these waters may be contaminated continuously or periodically, it is recommended that after a competent bacteriologist has been employed, thorough tests be made at regular intervals on all springs within the city used by one or more families. Springs which show evidence of pollution should be condemned and closed.

2. The result of the field examinations and bacteriological tests of many of the springs in Bluefield shows that there is a distinct danger of contracting typhoid fever by indiscriminate drinking of the water from private springs throughout the city.

### Sewerage and Sewage Disposal

1. The practice of allowing storm water to enter sanitary sewers and vice versa, of allowing sanitary wastes to enter storm water channels should be immediately discontinued in Bluefield.

2. The work which the city engineer has started of making a comprehensive and complete map of the entire system of sewerage in Bluefield should be continued and completed at the earliest possible time.

3. As rapidly as finances will permit extensions should be made to the existing system. Everybody having access to a city sewer should be required to connect immediately.

4. It is urgently recommended that the old sewage disposal plant be reconstructed along slightly different lines in order to partially purify the sewage from the East End of Bluefield.

### Privies and Scavenger System

1. Six hundred and fifty outside privies within the city limits of Bluefield is altogether too many for the good of the city. It is deliberately courting a typhoid epidemic to allow such conditions to continue. Extensions should be made to the existing sewerage system to eliminate as fast as possible these outside closets.

2. The majority of the privies, as can be seen by referring to the map, are located on the north side of the city and near the center of Bluefield. They are more generally located on the higher ground.

3. Many cases exist where a comparatively short extension of an existing sewer would eliminate a large number of privies.

4. There are practically no sanitary privies in the city. The existing privies should be required by law to be made water and fly tight and to be provided with a certain type of receptacle which is easily accessible to the scavenger.

5. Scavenger system is provided for approximately 80 percent of the outside privies. The work of the city scavenger should be under the direct supervision of the health department with proper laws and regulations to govern it. The present city scavenger gives evidence of doing his work efficiently and would welcome the inauguration of a

proper system by the city to provide for and maintain the privies in sanitary condition.

6. The logical way to provide for sanitary privies and a proper scavenger system is to pass an ordinance governing the question and see to it that it is carried out. This is too big a problem to be solved in a day or a week but a start can be made and work continued along progressive lines so that the city may be gradually made more clean and more healthy. A model ordinance dealing with this entire question has therefore been included in the appendix to this report.

### Typhoid Fever

1. The public water supply must be kept safe for drinking purposes at all times. Daily bacteriological tests will furnish information to assist in attaining this goal.

2. Proper supervision of the milk supplies must be instituted, for milk is an excellent medium to transport typhoid germs.

3. Better disposal of human wastes must be instituted. Detailed suggestions to better this phase of municipal life will be found under the section of this report on sewerage and sewage disposal.

### Garbage

1. Disposal of the garbage of Bluefield by incineration is a practical, economical and satisfactory method and it is recommended that this system be continued.

2. Free collection in a systematic manner by the municipality is in the end the cheapest for the citizens and the most sanitary as well as the most satisfactory arrangement. It is urgently recommended that this system be adopted rather than the system of levying fees.

3. A comprehensive garbage ordinance setting forth specifications regarding receptacles and the system of collection and disposal should be adopted by the city directors and placed on the status books.

### Milk Supervision

1. A modern milk ordinance should be enacted and then enforced. Examination of the milk ordinance of Bluefield showed that alterations are necessary to bring the ordinance in accord with modern knowledge and practice. A model milk ordinance has been listed in the appendix of this survey report.

2. Dairy inspections and scoring are vital. The solution of this problem will require frequent visits by the milk inspector who should carry on an educational campaign with the dairyman, not antagonizing them more than necessary. He should see that *proper methods* are used in the milk production and provide for tuberculin testing of all herds supplying milk to Bluefield.

3. A competent bacteriologist to make the chemical and bacteriological tests must be employed and he must have proper laboratory facilities, that is, good tools with which to do this important work.

### Health Department

1. The most serious drawback concerning the whole health department is the fact that a full-time health commissioner, properly trained for public health work, has not been provided. The health department will always be handicapped for doing effective work until such a step is taken. One of the encouraging facts is that the city manager and city directors are already considering the establishment of a properly equipped city laboratory and the employment of a well trained, competent bacteriologist, who will have full charge of the laboratory and carry on milk, water, food and diagnostic examinations. To take this step will better the health department tremendously and assist to make real accomplishments. The carrying out of this feature of the work and the employment of a full-time, properly qualified health commissioner can not be recommended too strongly.

### PUBLIC SWIMMING POOLS AND BATHING PLACES

There has been a rapid increase during the last two years in the number of both indoor and outdoor swimming pools in West Virginia with attendant dangers to the health of persons using these pools if the pools are not maintained in cleanly condition. To bring this forcibly before the operators as well as the bathers and the public in general, certain definite regulations governing public swimming pools and bathing places have been prepared by this division. Those regulations were adopted at a regular meeting of the Public Health Council July 26th, 1921, and during the past year the operators at the pools throughout the State have been familiarized with the new laws.

In order that these regulations and recommendations prepared by this department may be consistently followed, regular inspections of these pools and bathing places are made by the engineers from this department. Fundamental features of pool operation such as the disinfection of pool operation, renewal of water, methods of disinfecting the bathing suits, toilet facilities provided and the required use of shower baths are thoroughly investigated.

Permits for the construction of modern swimming pools have been given this year to the Charleston Y. W. C. A.; Terrapin Park at Parkersburg; Keyser; Rosemont Park at Martinsburg; Bethany College at Bethany; Luna Park at Charleston.

Posters setting forth certain requirements for bathers to follow have been sent to the operator of each pool. These posters are placed in several conspicuous places that each bather may read and follow the few simple instructions. A copy of this poster is shown below. Monthly operation reports modeled after the copy shown, are now being filed with the division.

A list of the pools located in West Virginia is given herewith setting forth the type of pool, dimensions, material of construction, capacity, greatest depth, water supply, whether re-circulation, filtration and chlorinating is practiced, and other pertinent data.

SWIMMING POOL COMPARATIVE CHART

NAME	TYPE	CAPACITY	WIDTH	LENGTH	DEPTH	CONSTRUCTION	SCUM GUTTERS	PUMP CAPACITY	NO. UNITS	NO. INLETS/OUTLETS	REPLACEMENT HOURS	SOURCE SUPPLY	FILTER UNITS	STERILIZING AGENT	WATER HEATER	NO. SHOWER HEADS
1 BERKELEY SPRINGS	CONTINUOUS REPLACEMENT	42000	20	75	2'-6"	CONCRETE TILE FACE	YES	GRAVITY	1			SPRING		NONE	NO	
2 LUNA PARK CHARLESTON	RE-CIR	200000	45	100	3	LUMBER	NO		1			CITY		CHLORINE	NO	
3 Y.M.C.A. CHARLESTON	RE-CIR	31000	20	37	3	7'-6" CONCRETE TILE FACE	YES	50 GPM	1	1	1	CITY	1	NONE	YES	
4 Y.M.C.A. CHARLESTON	RE-CIR	52000	20	60	3	9'-4" CONCRETE TILE FACE	YES					CITY				
5 HIGH SCHOOL CLARKSBURG	F & D	40000	20	50	3'-6"	7'-9" CONCRETE TILE FACE	YES					CITY		NONE		3
6 COUNTRY CLUB CLARKSBURG	CONTINUOUS REPLACEMENT	100000	34	80	2	8 CONCRETE	NO	200		1	1	5 DAYS WEST FORK RIVER		CHLORINE		3
7 Y.M.C.A. ELKINS	F & D	31000	16	50	3'-6"	7 CONCRETE TILE FACE	YES			1	1	CITY		HYPO-CL	YES	9
8 Y.M.C.A. FAIRMONT	RE-CIR	55000	30	48	3'-6"	7 CONCRETE TILE FACE	YES	50 GPM	1		30	CITY	1	HYPO-CL		
9 CAPDEN PARK HUNTINGDON	CONTINUOUS REPLACEMENT	400000	65	150	2'-4"	9 CONCRETE	NO	250 GPM	4		26	FOUR DRILLED WELLS		NONE		
10 MARSHALL COLLEGE HUNTINGTON	RE-CIR	25000	20	48		CONCRETE TILE FACE	YES	175 GPM	1		9	CITY	2			10
11 Y.M.C.A. HUNTINGTON	F & D	48000	22	48		CONCRETE TILE FACE	NO					CITY				10
12 ROSEMONT PARK MARTINSBURG	CONTINUOUS REPLACEMENT	28500	18	40	4	6'-6" CONCRETE TILE FACE	NO					CITY				
13 COUNTRY CLUB MARTINSBURG	F & D			2	8 CONCRETE	NO	ONE SIDE	300 GPM				BROOK		CHLORINE		
14 PARKERSBURG Y.M.C.A.	F & D	45000	25	45	4'-4"	CONCRETE TILE FACE	NO			1	1	CITY		CUSQ		
15 Y.M.C.A. WHEELING	RE-CIR	36000	20	40	5	7 CONCRETE TILE FACE	NO	50 GPM		1	1	CITY		CHLORINE	YES	10
16 Y.M.C.A. WHEELING	RE-CIR	36000	20	40	5	7 CONCRETE TILE FACE	NO	20 GPM		1	1	CITY		HYPO-CL	YES	12
17 FAIR GROUNDS WHEELING	RE-CIR	550000	75	185	1'-6"	8'-6" CONCRETE	NO			3	1	19 WELLS		CHLORINE		
18 WHEELING PARK WHEELING	F & D	250000	40	140	1'-6"	8 CONCRETE	NO			1	1	CITY			YES	2
19 WHITE SULPHUR SPRINGS	CONTINUOUS REPLACEMENT	180000	40	102	2'-6"	9 CONCRETE TILE FACE	YES	GRAVITY				SPRING		NONE		
20 CHESTER	F & D	40000	60	200	1	8 CONCRETE	NO			1	2	CITY		NONE		
21 Y.M.C.A. MT. HOPE	RE-CIR	36000	20	50	4	5'-6" CONCRETE	YES		1	1	1	CITY		HYPO	NO	8
22 SALEM	F & D	70000	40	60	3'-6"	4'-6" CONCRETE	NO			1	1	30 FOUR DRILLED WELLS		NONE	NO	
23 SWEET SPRING																
24 TERRAPIN PARK PARKERSBURG	RE-CIR	200000	80-40	150	7'-6"	CONCRETE	ONE SIDE	250	1	7	3	14 CITY	1	UV RAY	NO	10
25 BE THANY COLLEGE BETHANY	RE-CIR	60000	25	60	3	8 CONCRETE TILE FACE	YES	40	1	5	1	25 CITY	1	CHLORINE	YES	3
26 HUNTINGTON COUNTRY CLUB	F & D		30	75	2	8 CONCRETE	NO			2	1	TWO DRILLED WELLS		NONE	NO	



## NOTICE

Your Attention is Called to the Regulations Below Which are Posted in Accordance with the Law of the State Health Department.

It is Our Aim to Conform With This Law—Please Help Us.

1. No person having an obvious communicable disease, skin eruption, eye, ear, nose or throat infection, shall be permitted the use of any public swimming pool.

2. All persons should take a shower bath, using soap and thoroughly rinsing off body before entering the pool. The pool must not be considered a bath tub.

3. At indoor pools, bathing without suits should be practiced. If bathing suits are permitted they must be of one piece and made of non-linting, fast color material.

4. Bathers are requested to empty the bladder before entering pool. This is for your own protection.

5. Spitting in the pool, on the floor or in dressing room is prohibited.

6. No person in street dress shall be permitted on the walks about the pool.

7. The use of common towels, combs or brushes in the dressing room is prohibited.

8. Eating in or about the pool or otherwise directly or indirectly contaminating the pool is not allowed.

9. An attendant shall be present at all times when the pool is open to the public as a safeguard against accident. Deaths frequently occur where this notice is disregarded.

Please observe the above regulations carefully. They are to safeguard your own health and that of the other fellow. You are requested to report violation of these rules to the pool management and to the State Health Department.

—Please Display This Poster Prominently Near Your Swimming Pool—



MONTHLY OPERATION REPORT—SWIMMING POOLS

Town City Institution

Superintendent

Date

Date	Number Bathers	Hrs. Filters Operated Gals. Pumped	Gals. Fresh Water Added	Lbs. Alum Used	Lbs. Dis- infectant Applied	Pool Emptied and Cleaned	REMARKS: Bacteriological Tests
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
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26							
27							
28							
29							
30							
31							

## PUBLICITY WORK

### Division of Sanitary Engineering

A series of articles contributed to various newspapers urging new water supplies, particularly the construction of mechanical filtration plants, and letters sent occasionally to water works superintendents throughout the state.

Many charts and drawings have been made from which slides are made to be used in educational work through the medium of the newspaper, the motion picture house and the lecture platform. These methods have been used extensively in Wheeling, Grafton, Fairmont, Elkins, Piedmont, Morgantown, Logan and Parkersburg.

### On Guard

The two essentials for the attainment of a pure water supply are first, a properly designed filtration plant, and second, a reliable, conscientious and intelligent operator. Where either one of these fails the community is face to face with a situation pregnant with a smouldering sorrow—the possibility of an epidemic of water borne disease.

Affinity, W. Va., is one of an innumerable number of little mining camps nestling among the West Virginia hills. Here a small band of people spend their lives working in the bowels of Mother Earth, coming up at intervals to partake of sunshine and the portion of life's pleasure allotted to them. A colony of people secure in their belief that the ravages of disease would not unknowingly swoop down on them.

Suddenly and with explosive force one-tenth of the population was stretched on its back, knocked down by the scourge of typhoid fever. Striking at children but hitting mostly at that line which stretches from the age of twenty to thirty-five, the typhoid germ spared none, laying low, school teachers, miners and laborers. Is it necessary that these things should happen? Is there no way in which the typhoid fever germ may be effectively debarred from entering these small mining towns by the way of the avenue of impure water?

What were the conditions in Affinity? The coal company at that place supplies each inhabitant with his or her drinking water. Were they taking mechanical means to procure a safe water? Yes! A good pressure filtration system with chemical tanks, mixing chambers, settling basin and chlorinator completed their equipment. Surely that array should effectively safeguard the drinking water of the inhabitants. How many small towns in West Virginia can boast of better equipment?

However, one link was missing. The factor of personnel, upkeep and operation was not as admirable as the equipment. Insufficient flexibility in the addition of chemicals to meet the varying changes of the condition of the creek water coupled with the impairment and inoperation of the chlorinator, allowed the dirty, disease-producing water to be shot around through the towns in long thin streams—the distribution system.

What was the price of the careless operation of an adequate mechanical device capable of delivering pure water at all times?

**The Cost**

1 death .....	\$ 4,000.00
1 funeral .....	100.00
48 cases at \$100.00.....	4,800.00
Emergency hospital.....	500.00
400 days' work lost at \$4.00.....	1,600.00
	<hr/>
	\$11,000.00

A community loss of \$11,000.00 occurred as a result of faulty operation of a water plant. A levy of \$22.00 put on each of the 500 inhabitants of Affinity. What the town loses the individual must eventually shoulder himself in one form or the other. How many other towns at this present time are throwing an unnecessary burden on the shoulders of its citizens?

Is it not all-important that every owner of a water works plant, every superintendent, every operator, every laborer, concerns himself with the need of a constant vigil that no such affliction as that which suddenly swooped down on Affinity, W. Va., visit his place. Let's be on guard during this most dangerous period of the year?

**HOW METERS SLASHED POWER COSTS AT SHINNSTON, W. VA.**

In the year 1919 Shinnston had as its source of water supply the West Fork river with its load of mine wastes and sewage coming from cities such as Clarksburg. This filthy hard water had been consumed for many years.

In the year 1920 a modern filtration plant was installed which effectively removed the filthy material but still left a hard water due to the waste waters from the various mines. At times this water was acid in character and difficult to treat. Soon the citizens becoming accustomed to a clear water now demanded a soft water. Could the city afford to soften the water—would the increased cost be justified? Coincidentally with this objection to the hardness of the water arose a cry against the high operating cost attributable to the operation of the pumps.

It was decided to meter the whole town and thus cut down the waste of water and save in the cost of pumping. At that time the filtration plant was in use five hours per day pumping 150,000 gallons of water. *Power costs amounted to \$175.00 per month.*

In 1922 all consumers were metered. Today the plant is in use 2½ hours per day and 75,000 gallons of water per day are pumped. *Power costs amount to \$105.00 per month.*

A difference of \$70.00 a month—or a saving of 40% in monthly power costs.

During this period of changing from unmetered services to metered services, the number of consumers increased from 140 consumers to 225 consumers—an increase of 60%. Eighty-five more consumers, yet the total amount of water pumped cut in half.

This distinct saving due to the installation of meters decided the city authorities to adopt softening. The river water has an average hardness of 200 parts per million. Today the filtered tap water has an average hardness of 30 parts per million—soft delightful water. What is the cost of this water softening? Three hundred pounds of soda ash at a cost of \$1.00 per week is used. In addition there is the saving in pipe fixtures not to mention the saving in soaps and powders used by the householders.

**DOES METERING PAY? ASK THE PEOPLE OF SHINNSTON,**

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**MR. AVERAGE CITIZEN OF WHEELING—TO VOTE “YES” ON THE  
COMING BOND ISSUE WILL SAVE YOU MONEY**

The State Health Department is deeply interested in seeing the bond issue favorably acted upon in Wheeling, mainly for the reason that it will mean fewer deaths in Wheeling during the next year and better health for all the children and adults in the city. Experience since impure water became a thing of the past in Pittsburgh, Cincinnati and Philadelphia has taught that diseases of every character are markedly reduced after pure water is available.

In the first place, the dirty water which frequently comes into the water mains of Wheeling plugs up the meters and corrodes the plumbing fixtures so that Mr. Plumber is a frequent visitor to your house. Mr. Plumber is not one who forgets to send in his bill for payment on the first of the month and how costly those hours he works, are!

The corrosion of water lines and plumbing fixtures is rapid where raw, unfiltered water is pumped into the city as it is in Wheeling now and it will be the biggest kind of a saving for the citizens, separately and as a whole, when only pure water comes into the mains and into your homes. But, what of the sewage and typhoid germs which enter the Ohio river at Pittsburgh, Steubenville, East Liverpool and other cities above Wheeling which the chlorine gas is ineffective in killing when the water in the river is muddy. Here is the chief concern of the State Health Department and also here lies the source of money outgo for you, Mr. Average Citizen.

When your child comes home sick with fever and says her head aches and she wants to go to bed, you will not hesitate to call the doctor and even you may have to provide a trained nurse. And how frequently you must send to the drug store for medicine. Here is a big item of expense and you can when the bond election comes, forever put a barrier against such occurrences as pictured above if you will only use your good common sense and make a cross on the ballot favoring the building of a water filtration plant. It will mean money in your pocket to act in this way and will be a truly thrifty act.

### THE TRUE FABLE OF THE TYPHOID FEVER VISITOR

Wheeling is paid a visit yearly by that frequent visitor, Mr. Typhoid Fever. He's a funny fellow and he usually comes each year and about the same time each year. And what's still more peculiar, he never has been known to have had a personal invitation to come and visit a family—yet he does. He visits not only the poorest families but he makes his way into the very best families. He just works and squirms his way in and for the life of you you can't put your finger on him! Then when he does come he does so love to torment the members of the family, sometimes he becomes violent and often kills people in his funny way. Particularly so with the children who seem to be his favorites as they are ours. After a while he becomes fired of the town and moves on to play havoc with other little children in other towns. But he always comes back. You can be on the lookout for him about the same time each year. Some of the cities make a special effort to catch him at that time but as a rule they just let him hang around and pretty soon he finds they aren't paying much attention to him so after doing his work he slips out as quietly as he came in.

How do you suppose they find Mr. Typhoid Fever? How did they find a way to prevent him from entering the town? Did they build a big wall around the town and put a moat outside the wall in order that he would fall into the water when he tried to enter the town? No, they just found out that he traveled in a peculiar vehicle, a little drop of water. So they took these vehicles, one by one, and washed and cleaned them and applied chemicals so that when he jumped into his drop of water the chemical would suffocate him. And so today in Wheeling we have his little vehicles being sent through great big pipes, then into little ones and then into the houses from which they are drawn by the children into little cups. Now Mr. Typhoid Fever may be on hand at any time in these little droplets, to be gulped down by the thousands by the children and grown-ups.

How much longer before Wheeling will corner this little fellow and drive him to the ballot box and each citizen at the words, "Get ready, aim, vote!" will cast his ballot against this fellow and sound his death knell forever.

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### A MICROSCOPICAL ROMANCE NEAR WHEELING

"How far is it from here to Wheeling," called out Tim Typhoid, one of the many thousand typhoid germs hurrying along down the muddy Ohio river. He had just passed the large sewer pipe discharging into the Ohio at Steubenville where a jolly crowd of his cousins were rushing out into the stream from the sewer. Mary Typhoid heard his call for information and hastened to reassure him.

"You have only about twenty-five miles to go, Tim, and at the speed you are making on this swift, muddy current you ought to get there at about 5 o'clock tonight, that is, before supper time in Wheeling."

"That's good," replied Tim, "I am getting rather tired. I've started at Pittsburgh and lost some of my companions just above Steubenville.

As we were hurrying along by the end of the intake pipe at the water works pumping station, they were sucked up and drawn into the filtration plant. They tell me it is sure death to get into the sand beds of that filter plant. You get strangled and crushed between the sand grains. My companions are probably dead by this time. Where did you come from Mary, and where are you going?"

"Oh, I lived inside a big fat man here in Steubenville who contracted his fever from drinking unfiltered river water. We had a fine, big family. But after we broke up housekeeping in his intestines—there were so many of us we simply had to get out—I came into the large, cold sewer. I have been cold and shivery ever since getting out of our fine warm home inside of him and if I don't get out of this cold, muddy Ohio river water soon I am sure I can't live long." "Mary, let's get married," said Tim, "and we'll hurry on down the river to Wheeling, there I know we will find a place to live. They tell me that there is no filter plant there at all. We can jump into the water lines at the pump station and get a fast ride up the hill to the reservoir. After we get to the reservoir it will be easy to coast down hill to the city hall or to any of the public buildings or homes and there some person will surely drink us up and we will have a warm home again.

"All right," said Mary, "I'll go with you. I never expected I would find another large city like Wheeling without a filter plant, for every other large city that I know of on the Ohio river now has a filtration system which won't let us get through to the people. Isn't it good luck for us that we and all our cousins of the typhoid family can have free passes into Wheeling? I hope they never get wise to the filter plant idea for then we would have to get out and move on to some little town. I would much rather live in a big city."

"Well, then, we'll stick together through thick and thin and raise a family in Wheeling."

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### PURE WATER AND THE MANUFACTURER

Wonder what a manufacturer must think when putting the raw Guyandotte river water into his boilers and throughout the plant? That would be a good subject for a Briggs cartoon. He probably keeps his thoughts to himself biding the time when the awakened conscience of the people will no longer permit a mine-polluted and turbid water to enter the city mains. The presence in a river water of an acid or its combination with other metals leads to many serious inconveniences and to great expense. Does the average person realize that for every ton of coal produced twenty pounds of sulphuric acid is brought forth as a by-product to spend itself in some stream or to be taken up by other metals. However, while Logan is permitting such a polluted water to be circulated throughout the city at this time, active steps are now being taken by the water company to rid the water of these impurities. By next spring the day of impure water will have passed out along with other discarded implements of former city progress.

Boiler scale results from certain chemicals in the water which are precipitated when the water is heated and form a hard scale on the



iron surface of the boiler or the tubes. Boiler scale then forms a thin coat on the surface of the iron and prevents the passage of heat through the iron and scale layers to the water. This causes overheating of that portion of the boiler and results eventually in destroying the plate with the consequent renewal of the boiler not taking into account the danger of an explosion. Water coming from deep wells and rivers containing much mineral content are particularly harmful and to be rendered harmless must be treated to remove the objectionable minerals.

The presence of grease in a water causes any sludge formed in a boiler to become very sticky and causes trouble similar to a hard scale. Grease will be found mostly in river waters and must be removed by treatment. Thus, the contents of the water mean considerable outlay to the manufacturer as it affects him in four ways: increased labor, greater expenses for operations and repairs, shortened life of the plant and increased liability of explosion.

Wonder what the manufacturer would say if some bright day he awoke and found a clear filtered water, greaseless and without harmful minerals. You ask him personally.

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### FILTRATION PLUS METERS

It is generally conceded that metering a public water supply is the most economical method of dealing with this commodity. The Public Service Commission of this state feels very strongly on this subject and justly so because each year brings further confirmatory evidence that metering tends to put a water company on a real business footing. There is hardly any reason why water should not be sold just as you are sold gas, apples or electricity.

The principal objection to the metering of a water supply is the old saying that it will limit the amount of water and thus discourage cleanliness. One can easily picture the type of citizen uttering this warning with his chest out and sporting the air of a ward politician. If he were right then such cities as Huntington and Clarksburg should show a citizenry, badly in need of more water for they are fully metered. Yet one hardly believes they are not receiving plenty of water. Surely the farmer who uses only a fraction of what the city dwellers use can not be accused of uncleanness.

However, whether the people want meters or do not want meters is of little concern when you have a water that can not be metered by the usual type of household meter. Some waters have such large amounts of minerals in them that they encrust the meters and render them useless or else the repair bill amounts yearly to a high sum and is thus objectionable. Such a water is found in New Martinsville where, after a short period of trial, the meters were removed.

Similarly a water containing much acid will in time disintegrate the meter and render it worthless. Imagine the effect such a water must have on the human bodies. Yet there are many small towns using such a water where mine drainage pollutes the stream.

A third kind of water is a surface water that is alternately clear and muddy. The particles of clay and organic matter clog up the meter and as a consequence it registers perhaps too much or too little or else does not register at all. If the meters are kept in use the high repair bills eventually fall on the shoulders of the consumers who are then compelled to assume an added financial burden.

The procedure to adopt in getting rid of any of these troublesome waters is filtration. That is the only sure and well tried method. Logan, with its water supply polluted by mine drainage and surface washing, can be given a real cleaning by filtration. As it is at present the loss to the people in actual money is considerable and this loss, due to impure water and the inability to meter it, can be readily calculated. However, that will form an interesting topic for the next article.

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### A MODERN RAPID SAND FILTER PLANT—A REMARKABLE PROCESS

Since 1890 or thereabouts, there has come about a remarkable development of a process which can produce clear, colorless, tasteless, bacterialess, drinking water from a muddy contaminated river water. How was the discovery made? First, the people in the lumber mills in the forests of Maine started the idea of filtering water through a wooden tub filled with sand, in order to remove the sawdust floating in the river water. They found this process took out the sawdust particles and dirt and left a clear, sparkling water.

Later, experiments were carried on at Louisville, Ky., using the muddy Ohio river water. Here large concrete boxes were constructed and filled with sand and gravel. It was found that the first step to be taken was that of carrying the water from the river to a large lake allowing it to become quiet. Over half the dirt settled out in this large body of still water. Then an action is brought about which is similar to that produced when an egg shell is thrown into a coffee pot to clear up the grounds. Two chemicals—lime and alum—are added and react in the coagulation basin to which the water flows from the lake so that jelly-like snowflakes are formed. These so-called heavy jelly-like snowflakes are made up of the two substances—lime and alum---so that practically all the chemicals introduced are taken out again before the water reaches the filters. Many people do not realize this and think that the chemicals remain in the water. Now that the lime and alum have been removed in this settling out process which resembles the coffee pot reaction on a large scale, the water passes through five feet of fine sand and gravel to the clear water reservoir under the filters. The modern filter plants operate upon the principles and processes just described which were worked out on a practical scale at Louisville, Ky., before the large rapid sand filter plants like those at Cincinnati and Columbus were built. Such filtration plants remove 100 per cent of the dirt and bacteria and supply an absolutely safe drinking water to the people.

It is such a mechanical filter plant that you in Logan have a legitimate right to demand. Is it necessary, knowing the amount of filth being car-

ried down by the Guyandotte river, that you should be deprived of this remarkable process to remove these impurities? Ought you to ask your children to assume unnecessary health risks from water-borne diseases, a condition which as the Guyan Valley opens up becomes more acute. Rather the citizens will want to co-operate with the water company and together put in a rapid sand filter plant.

A modern filter plant and distribution system is one of the chief assets of a city; in value it ranks well toward the top of all the city investments. The success and continued operation of all other industries, factories, etc., are dependent entirely upon the water works. The health, growth and prosperity of the community are dependant upon the purity and cleanliness of its water supply. Knowing these facts, is a thriving community such as Logan going to stop short of filtration to obtain these advantages for Logan which mean so much to her social, industrial and commercial life?

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### CHLORINATION ONLY A FACTOR OF SAFETY

Chlorination of water supplies as practiced throughout West Virginia serves in two capacities, namely, first, as a sole agent for the sterilization of water for small towns; secondly, as a factor of safety in filter plant operation. In many small towns the expense of adequate filtration is too large a burden to be borne by the few inhabitants. In that case sole reliance is placed on a chlorinator. In towns where sufficient funds can be obtained for a filter plant, chlorination is used as a factor of safety to kill what few bacteria may be found in the water coming from the filters.

Chlorination is the process of supplying gaseous chlorine to the water at such a rate that all bacteria will be killed but at a rate of dosage that is not noticeable by the consumers. When the water has been filtered very little mud, organic or other foreign material remains suspended or otherwise held in solution and thus the only matter left for the chlorine to oxidize is the bacteria. Thus little is used and what is used is effective. On the other hand where untreated water such as the Ohio river is chlorinated, the presence of foreign matter requires additional chlorine as the foreign matter consumes chlorine as does the bacteria. Suppose then that a sudden rain comes and brings down from the hillside the filth of the countryside. This means that all the chlorine applied will be consumed by a part of the foreign matter in the water and the remainder will be unacted upon. While these fluctuations can be met at times, it is readily apparent that one can not judge the quality of the foreign matter with respect to its power to consume the oxidizing agent or the chlorine gas as it is called. There is then a wide margin here and it means the difference between a constantly safe water and an intermittently safe water.

What constant vigilance in the operation of a chlorinator means can best be illustrated by the case of Pittsburg, California. Here the water is treated with chlorine. Due to negligence the operator found himself running short of chlorine gas and immediately sent to the nearest supply

station for a new tank of gas. Unfortunately on receipt of the tank it was found that it required a different connection to fit with the existing feed line. As the nearest supply station using their style of tank was two days distant, this meant water passing through the city mains unchlorinated. Result: 8 cases of typhoid and 200 cases of dysentery. Now how could this have been avoided? Simply by the expedient of having not only excess gas on hand but duplicate parts to the chlorinator.

Can not this same misfortune happen to Logan if sufficient care is not taken to see that chlorine gas is always on hand and that extra parts are always near so in case of a breakdown the chlorinator can resume its duty of killing the deadly disease germs.

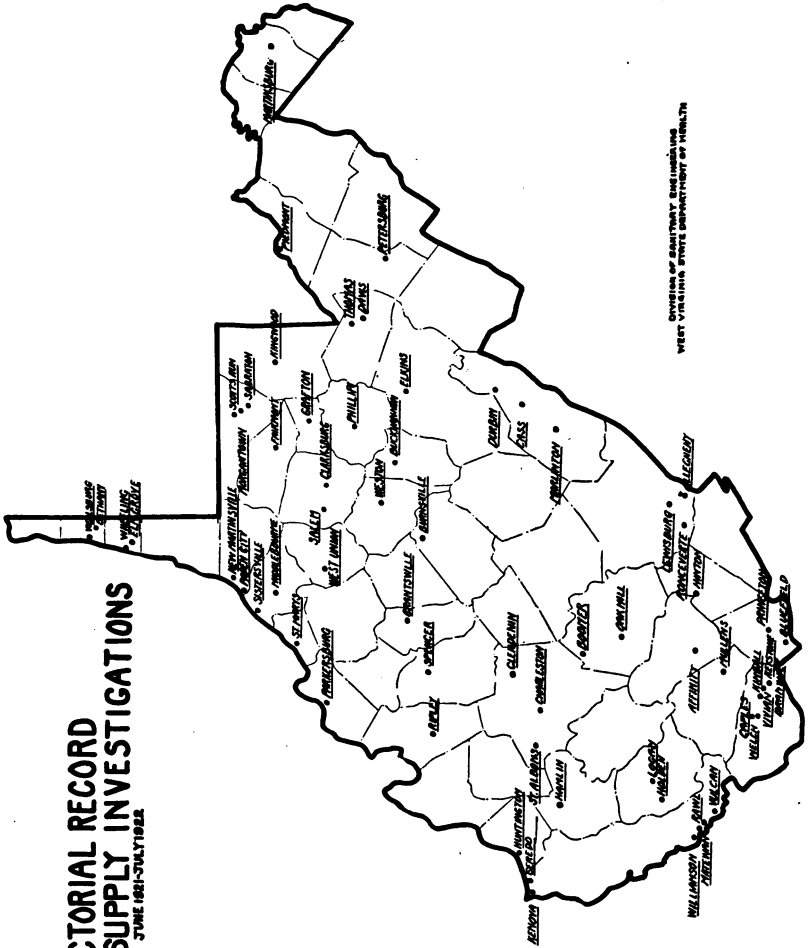
CHART—PUBLIC ADDRESSES—1921-1922

Town and County	Date	Subject Matter	Public Body Addressed	REMARKS
New Martinsville—Wetzel County . . . .	Sept. 1921	Public water supply.	City Council and business men.	Additional water supply needed. Report to be made by engineer.
Logan—Logan County . . . . .	Sept. 1921	Proposed filtration plant.	City officials, water company, superintendents and citizens.	Filtration plant proposal discussed—special reference to financing project.
Morgantown—Monongalia County . . . .	June 1922	Water supply, sewerage system, and what is a Sanitary Survey.	Kiwanis and Rotary Clubs.	Need for comprehensive sewerage system outlined in detail. Proposal of Sanitary Survey.
Mason City—Mason County . . . . .	Aug. 1921	Town Sanitation.	Mass Meeting.	Special emphasis on need of public water supply.
Oak Hill—Fayette County . . . . .	May 1922	Development of new public water supply.	Chamber of Commerce.	Source of water supply and financial outlay outlined.
Sutton—Braxton County . . . . .	May 1922	Safeguarding a surface water supply by chlorination.	Woman's Club.	Special emphasis on need of chlorination at Sutton to ward off typhoid fever.
Keyser—Mineral County . . . . .	Feb. 1922	Why Keyser should meter the water supplied to citizens.	Rotary Club.	Shortage of water makes metering a vital necessity.
Fayetteville—Fayette County . . . . .	Sept. 1922	Functions of a State Department of Health.	Teacher's Institute.	Special attention to work of Division of Sanitary Engineering.
Hinton—Summers County . . . . .	Sept. 1922	What Sanitary Engineers do to Safeguard West Virginia Citizens.	Teacher's Institute.	Work of sanitary engineers in Hinton outlined.
Weston—Lewis County . . . . .	Oct. 1922	Weston Water Supply.	Rotary Club.	How daily bacteriological tests are made at new laboratory.
Montgomery—Fayette County . . . . .	Aug. 1922	Garbage Incinerator for Montgomery.	City Council and Citizens.	Garbage disposal by incineration cost data given.

CHART—PUBLIC ADDRESSES—1921-1922—Continued

Town and County	Date	Subject Matter	Public Body Addressed	REMARKS
Lewisburg—Greenbrier County.....	Nov. 1921	Filtration plant for Lewisburg—cost data outlined.	Mass Meeting at Court House.	Stereopticon lecture given showing operation of filter plant.
Charleston—Kanawha County.....	Nov. 1921	Charleston's Water Supply.	Lions Club of Charleston.	Stereopticon lecture showing how polluted surface water supplies are purified.
Morgantown—Monongalia County....	Nov. 1921	Need for sewerage and sewage disposal at Morgantown.	Morgantown Engineer's Club at banquet.	Morgantown's need of sewers outlined with policy for sewage disposal.
Piedmont—Mineral County.....	Jan. 1922	Proposed Bond Issue for Filtered Water supply.	Mass Meeting in moving picture theatre.	Stereopticon slides shown and process of filtration explained.
Institute.....	Jan. 1922	Typhoid Prevention.	Body of students in Assembly Hall.	How typhoid fever is spread by various agencies outlined in stereopticon lecture.
Charleston—Kanawha County.....	Feb. 1922	Garbage Incinerator.	Public Meeting—Court House.	Meeting was called to stimulate interest in bond issue for municipal improvements.
Beckley—Raleigh County.....	Aug. 1921	Water Filtration.	Teacher's Institute.	Filtration processes described by means of lantern slides.
Charleston.....	Jan. 1922	Sewering and Public Health.	Boy Scout Leaders and Boy Scouts.	Sanitation in Camp and Typhoid Prevention outlined.
Charlburg Cumberland, Md.....	April 1922	REGIONAL CONFERENCES WITH HEALTH OFFICERS AND PUBLIC HEALTH NURSES OF WEST VIRGINIA		
Bluefield Charleston				
Washington, D. C.....	May 1922	MEETING OF ALL STATE SANITARY ENGINEERS IN UNITED STATES WITH OFFICIALS OF U. S. PUBLIC HEALTH SERVICE TO DISCUSS POLICIES OF WORK AND SPECIAL PROBLEMS OF SANITARY ENGINEERS.		

**PICTORIAL RECORD  
WATER SUPPLY INVESTIGATIONS**  
JUNE 1921-JULY 1922



## FIELD WORK

## Water Supplies, Sewerage and Miscellaneous Activities

**Affinity, Raleigh County—December 31st, 1921—**On receipt of news of several cases of typhoid in Affinity an engineer was dispatched to Affinity. Within a few days fifty-odd cases of typhoid fever occurred in a population of 500. The public water supply which is obtained from a small creek, is filtered and then chlorinated. However, the filters were not operating properly and the chlorinator was shut down. This permitted typhoid germs to enter the water distribution system and resulted in a serious epidemic. Immediately on the arrival of the sanitary engineer the chlorinator was repaired and started and the water highly chlorinated. All the water lines were opened up and this heavily chlorinated water pumped through. An emergency hospital was then organized and arrangements made to take care of the body wastes of the victims. Cordial co-operation was obtained from the officials who realized that the outbreak was due to carelessness and was preventable at all times had the water purification facilities which were available been used. All coal colonies and camps below Affinity were notified to take permanent steps to disinfect their water supplies if taken from this creek.

**Affinity, Raleigh County—June 2nd, 1922—**Inspection of filter plant and chlorinator made. Both operating satisfactorily. Reports of operation to be filed with department.

**Alleghany, Greenbrier County—June 15th, 1922—**Sanitary survey of new girls' camp made. Recommendations for building of safe spring and proper methods of disposing of household and body wastes.

**Alderson, Monroe County—July 8th, 1921 and March 24th, 1922—**Chlorinator inspections made. On March 24th, 1922, meeting with city council to emphasize the necessity of operating the chlorinator, in order that there would be no more water-borne typhoid fever in the community.

**Alderson, Greenbrier County—July 6th, 1921—**Visited Camp Greenbrier and made a sanitary inspection of the same. A small incinerator was recommended for disposal of the kitchen wastes.

**Bethany, Brooke County—September 16th, 1921—**A complete survey of the water supply of Bethany was made in company with Mr. Goodnight, President of Bethany College. The college has installed for itself and the town a complete water system using filtration galleries located near Buffalo creek as their source of water supply. Recommendations were made to the effect that chlorination of the water be adopted due to the fact that there is an evident possibility of the flooding of these galleries by a sudden high rise in Buffalo creek. This matter is to be taken up with the school trustees for favorable action.

**Braeholm, Logan County—July 21st, 1921—**Complaint of bad water having reached this office from a local miners' union, an engineer was sent to investigate the trouble. The water was found to contain considerable iron and sulphur which made it undesirable for drinking purposes. A plan of an aerator designed to rid the water of iron and sulphur was sent to the mine officials. Samples of several other wells



were taken for bacterial analysis and a few metal signs were posted throughout the mining camp which pertain to typhoid fever, its cause and how to prevent it.

**Bertha Mines, Monongalia County—May 1st, 1922—**Complete sanitary survey made of this mining colony situated four miles north of Morgantown. Suggestions for betterment of water and better removal of sewage given to mine officials in detail, also illustrated report.

**Burnsville, Braxton County—December 12th, 1921—**Burnsville visited and water supply for the town inspected. The water supply is obtained from the Little Kanawha river and is not treated. Chlorinator recommended.

**Boomer, Fayette County—March 30th, 1922—**Boomer visited to carry on water supply investigation. Water is obtained from the Kanawha river and is pumped directly into the mining camp. Chlorinator recommended.

**Barboursville, Cabell County—April 11th, 1922—**Chlorinator inspected.

**Black Betsey, Putnam County—August 27th, 1921—**Black Betsey visited and the operation of the chlorinator checked. The use of orthotoluidin testing set explained to the operator.

**Bluefield, Mercer County—December, 1921 and January, 1922—**During this period a complete sanitary survey of the City of Bluefield was made. Details of the survey and results accomplished mentioned in this annual report. Complete report of survey with definite recommendations sent to city administration.

**Bluefield, Mercer County—May 31st to June 3rd, 1922—**Bluefield visited to investigate emergency water supply for the city. Temporary filter plant had been built to filter the Bluestone river water. Detailed study of the pollution of the Bluestone river at Graham was made and the emergency filter plant operated for a week. From the results of the study of the Bluestone river and the operation of the filters, the intake at Graham was recommended to be carried a mile up stream.

**Berryburg Junction, Barbour County—September 10th, 1921—**Berryburg Junction visited to investigate the railroad water supply. Supply condemned.

**Bramwell, Mercer County—August 12th, 1921—**Bramwell visited and the water supply for the town investigated.

**Bower and Norton, Randolph County—September 21st, 1921—**Inspected chlorinators and explained orthotoluidin to superintendent in charge.

**Charleston, Kanawha County—July 17th, to July 21st, 1921—**A four day inspection of the 9,000,000-gallon filtration plant was made by one of the engineers from this department. Operation details were thoroughly investigated. Several recommendations were made which affected the operation of the plant and which had to do with re-vamping some of the units of the plant. Among the improvements suggested and which have been brought to completion and which affect not only the quality of water but the efficient operation of the plant, were the installation of baffles in the larger sedimentation basin, the installation of a solution feed of chlorine, and a decided improvement in the method of alum treatment. By using baffles at either end of the sedimentation basin and a new baffle in the middle of the basin, the full capacity of the basin is

utilized. Heretofore strata of water formed in the basin depending on the temperature of the river water entering the basin.

The old cumbersome chemical tanks have now been supplanted by absorption tanks which feed directly to the suction line of the low-lift pumps. This eliminates the long chemical line heretofore used in applying the chemicals to the water as it enters the settling basin. With the present arrangement, through mixing of the two chemicals—lime and alum—is obtained during the passage of the treated water from the suction line of the raw water pumps to the settling basin. This change means better and cheaper operation and higher efficiency in the basin. An accurate measurement of the water to be treated is now obtained by the use of a Venturi meter which measures the flow of the water through the pumps. This is important since a considerable fluctuation is present in the water demand of Charleston. A complete report of these and other recommendations was sent to the company officials and practically all recommendations have or are in the process of being carried out.

Capels, McDowell County—August 4th, 1921—Capels visited in Chesapeake & Ohio depot at the request of the Woman's Club of the city. Recommendations made for improvement of the drinking water supply at the station and also the toilets.

Charles Town, Jefferson County—February 25th, 1922—Inspected chlorinator. Recommended spare parts for chlorinator and installation of stand pipe to permit sediment to drop out of water before entering chlorinator.

Chester, Hancock County—September 17th, 1921—An inspection and report was made of the outdoor swimming pool owned by C. A. Smith, Jr., and located at Rock Springs Park Company. Recommendations were made for the installation of a chlorinator and re-circulating pump and filter in order that a continuous supply of safe water may be supplied to the bathers. This is very important particularly since many excursions from Ohio and Pennsylvania are made to this park and many of the excursionists use the pool. Thus the spread of disease over a wide area is possible.

Clifton, Mason County—February 4th, 1922—Investigation of water supply used by New Castle and Ohio Ferry Company for use on its boats. Supply to be abandoned.

Catlettsburg, Kentucky—December 12th, 1921—Inspection made of the water plant at Catlettsburg, Ky., which supplies water across Big Sandy river to Kenova and Ceredo, W. Va. Inspected the chlorinator and recommended that filters be remodeled and sedimentation basin baffled.

Cass, Pocahontas County—September 10th, 1921—Cass visited and the chlorinator inspected. Trouble had been experienced in the satisfactory operation of the same. Proposed changes in the water supply for the town discussed.

Clendenin, Kanawha County—August 29th, 1921—Chlorinator inspected and orthotoluidin testing kit explained. Recommendation made that either one suction line supply all the pumps or that an additional

chlorinator be purchased. On December 15th, 1921, emergency tank of gas installed on account of shortage.

**Ceredo, Wayne County**—October, 1921—Ceredo visited to ascertain the status of the water supply for the town. Drilled well has been abandoned and water supply is now obtained from the Catlettsburg, Kenova and Ceredo Water Company.

**Capels, McDowell County**—August 4th, 1921—Capels visited in response to a request from coal company to inspect the water supply for the camp. Recommendation made that an iron removal plant and a chlorinator be installed.

**Chapmanville, Logan County**—August 9th, 1921—Chapmanville visited and outbreak of typhoid investigated. The cause of the typhoid was traced to an infected well which received drainage from a number of privies on high ground.

**Clarksburg, Cumberland, Md.—Charleston—Bluefield**—April 12th to 26th, 1922—During this period a series of Regional Conferences were held in these towns with health officers and public health nurses. All directors of the several divisions of the State Health Department attending sessions in a body, made short talks and answered questions by health officers and nurses in a round table discussion.

**Davis, Tucker County**—February 22nd, 1922—Met officials of town and visited plant in company with town recorder. Chlorinating plant not operating. Chlorinator repaired and put in operation.

**Davis, Tucker County**—July 15th, 1921—Davis visited to inspect chlorinator. The chlorinator had not been in use for some time due to exhaustion of gas supply. Chlorinator put in operation.

**Durbin, Pocahontas County**—August 31st, 1921—Visited Durbin and looked over the proposed new water supply for the town. It was intended to pipe water into the town by gravity from a mountain spring.

**Dunbar, Kanawha County**—June 24th, 1922—Chlorinator and pressure filter plant operation checked. Operator assisted in making chemical tests so that the filters may be better operated. Recommendations for improvement to be adopted.

**Dunbar, Kanawha County**—June 15th, 1922—Conference with the superintendent and investigation of present practice of operation of pressure filter and chlorinator. Additional equipment necessary. Apparatus for introducing lime into suction line and making chemical tests will be installed.

**Elkins, Randolph County**—February 21st, 1922—Inspected new filter plant now under construction at Elkins. Construction of concrete substructure finished. Plant to be of 2,000,000 gallons capacity and will be finished early in the summer.

**Elkins, Randolph County**—February 21st, 1922—Inspected new 40,000 gallon swimming pool to be constructed at Elkins Y. M. C. A. Pool will have continuous circulation by hot water heating system and disinfection by hypochlorite of lime. Shower baths and toilet facilities have been provided for both male and female bathers.

**Elkins, Randolph County**—September 21st, 1921—Chlorinator inspected and the orthotoluidin testing set explained to the engineer in charge of the water plant.

**Elkhorn, McDowell County**—August 3rd, 1921—Elkhorn visited to inspect the water supply for the mining camp. Installation of a water softener discussed with engineering company.

**Fairmont, Marion County**—July 17th, 1921—Conference with Major Smith, Editor of Fairmont Times, relative to the insertion of weekly articles in his newspaper to bring out various phases of the unsatisfactory public water supply as a beginning in the campaign to have Fairmont adopt mechanical filtration.

**Fairmont, Marion County**—July 18th, 1921—Requested by city to obtain complete equipment list for new laboratory to be maintained by the city. Orthotoluidin test explained to operator. Pump station and plant inspected. Operation satisfactory.

**Fairmont, Marion County**—January 14th, 1922—Inspection made of Domestic Coke Company at Fairmont. Plant manufactures coke and by-products with phenol trade wastes probably causing tastes in Morgantown city supply. O. C. Gericke, manager of plant, will cooperate in treating trade wastes so as to render them inoffensive.

**Fairmont, Marion County**—August 17th, 1921—Sanitary survey made of Fairmont embracing water and sewerage systems. House to house survey made of wells and privies. Recommendations made for abandonment of wells and spring and privies and detailed needs of improvement to sewerage systems. City has many objectionable sewer outlets which are a menace to the city, particularly in certain residential sections. Data collected to be used as basis for series of articles in Fairmont Times to stimulate better public health.

**Follansbee, Hancock County**—February 4th, 1922—Investigation of nuisance caused by fumes and odors from sewers due to coal tar wastes from gas plant of Follansbee Steel Company. Recommended installation of traps on street corner above plant and later construction of separate sewer system by the steel company to carry away tar wastes. The former recommendation was acted upon by the city authorities.

**Grafton, Taylor County**—July 15th, 1921—Met Mayor and Water Commissioner and visited water plant. Chlorinator not working due to poor connection into suction line. Temporary arrangement was made in order to chlorinate the water as soon as possible. The seeming indifference of the city towards chlorination or other protection of the water supply caused the writing of a report placing the responsibility for the neglect of this necessary equipment. During 1922 city purchased new permanent equipment which is giving satisfactory service.

**Grafton, Taylor County**—July 17th, 1921—Inspection of small pressure filters located in Baltimore & Ohio terminal was made. These filters deliver Grafton city water for use on railroad passenger coaches. The necessity of the use of alum was explained to the operator and alum was immediately ordered by the railroad company. The filters are now being regularly supplied with alum.

**Grafton, Taylor County**—November 1st, 1921—Met with the Secretary of the Chamber of Commerce and discussed proposed bond issue. Inspection showed chlorinator loaned to city by the State Department of Health was operating satisfactorily.

**Glen Rogers, Wyoming County—June 1st, 1922—**Investigation made of sanitary conditions of Glen Rogers, a new mining camp to be erected at that place. Recommendations as to water supply, garbage collection and sewage disposal made to officials of company.

**Glen Ferris, Fayette County—August 26th, 1921—**Glen Ferris visited and the chlorinator inspected. Operation of the pressure filters discussed with the chemist in charge. The orthotoluidin testing kit for the regulation of chlorinator explained. Operation of the pressure filters and chlorinator satisfactory.

**Gilbert, Mingo County—February 21st, 1922—**Gilbert visited and the proposed water supply for the town discussed. No action taken on account of the cost.

**Gassaway, Braxton County—September, 1921—**Chlorinator inspected and orthotoluidin testing set explained. Complaints received; tastes in the water supply caused probably by the wastes from a wood alcohol plant located four miles above Gassaway on the river.

**Gilmer, Gilmer County—August, 1921—**Glenville visited to get information regarding outbreak of typhoid fever occurring in the county. Typhoid so scattered that no effective steps could be taken.

**Hinton, Summers County—July 8th, 1921—**At the request of the State Fire Insurance Inspector of that place a survey of various unsanitary conditions was made in company with the Inspector. Report made and sent to city authorities calling attention to existing conditions and making recommendations to combat these conditions.

**Hinton, Summers County—June 14th, 1922—**Installed and began operation of new orifice box for accurate feed of chemicals. Chemical tests explained to operators. Chlorinator not working. Repaired and started again.

**Hinton, Summers County—January 11th and March 21st, 1921—**Operation of the pressure filter water plant and chlorinator investigated. Orthotoluidin testing set for the better operation of the chlorinator explained and the necessity for carrying on tests emphasized.

**Hinton, Summers County—January 11th and 12th, 1922—**Hinton visited and an outbreak of typhoid fever occurring there during the latter part of December carefully investigated. The result of the investigation showed that the outbreak was water borne. Recommendations were made for improvements at the filter plant and for better supervision of the same. Cooperation from this company has been poor.

**Hundred, Wetzel County—September 20th, 1921—**An outbreak of typhoid fever at Hundred was investigated by one of the engineers. Typhoid fever has been endemic here and is attributed to the insanitary condition of privies. Practically every privy in town was visited and notations made. Recommendations for improvements were listed in detail with the Health Officer and a model privy ordinance forwarded to the Mayor of Hundred to be incorporated in the local health laws.

**Huntington, Cabell County—September 29th, 1921—**Inspection of wells of State Hospital at request of Superintendent Guthrie. Inspection of Huntington filter plant in company with Superintendent H. E. Watt. Two new filters being added at filter plant and changes made in distribution system in the way of larger pipes with consequent better service.

**Huntington, Cabell County**—June 30th, 1922—Installed chlorinator at plant of International Nickel Company of Huntington. Operation of chlorination and method of control by orthotoluidin test explained to chief chemist of plant.

**Huntington, Cabell County**—July 1st, 1922—A Boy Scout camp located on Twelve Pole Creek a few miles from Huntington was inspected in company with Messrs. Marcum and Cort, Scout leaders. Recommendations for a safe water, a proper disposal of body and kitchen wastes were recommended and explained to the men on the grounds. This is one of the many summer camps visited by representatives of this department in an effort to have the younger boys and girls early assimilate the fundamental health rules and appreciate clean living conditions.

**Huntington, Cabell County**—July 1st, 1922—Inspections were made of the Marshall College swimming pools as well as of the newly constructed pool belonging to the Guyan Valley Country Club.

**Huntington, Cabell County**—July 1st, 1922—Inspection made of the new 1,000,000 gallon sedimentation basin of the Huntington Water Company. This new basin will give an additional settling capacity at the present rate of filtration, of 6 hours. Heretofore insufficient settling period was available which threw entirely too much of the work on to the filters. With this new basin a clearer water will be applied to the filters and will result in a better water for the consumers. Additional filters are being added to the plant to make a total filtering capacity of 9,000,000 gallons as contrasted with the present capacity of 5,000,000 gallons. A new unit of 1,000,000 gallons having been added to the old plant at the time of the construction of the above settling basin. A modern well equipped laboratory is being installed in the new power house. These improvements are the result in a large part of the consistent and persistent efforts of this department to make the Huntington Water Company realize that a growing city such as Huntington would not nor could not afford to tolerate a plant ill-equipped for the usual work, and poorly, for emergencies.

**Huntington, Cabell County**—May 25th, 1922—Conference with city authorities with regard to making plans for new sewerage system in Huntington. Investigation also made of the new swimming pool which is being constructed at the Guyan Country Club.

**Holden, Logan County**—February 20th, 1922—Holden visited. Operation of the water softener and filter plant which supplies water to the people in the town investigated. Recommendation made that chlorinator be installed. This recommendation was complied with later on in the year.

**Hamlin, Lincoln County**—September 26th and 27th, 1921—Hamlin visited and a complete sanitary survey of the town carried on. Sewerage conditions intolerable. The most important recommendation as result of survey was that the town at the earliest possible moment install a sewerage system.

**Jackson Mills, Lewis County**—June 19th, 1922—Three-day course in water supply protection and construction of sanitary privies, given to the camp leaders who, during the summer months, will have charge of the

4-H boys and girls camps in 35 counties in West Virginia. System of weekly reporting devised.

Kingwood, Preston County—July 18th, 1921—Inspection of pump station and water plant. Chlorinator put in operation. Recommended purchase of spare parts. Orthotoluidin test for control of chlorine dosage explained to operator.

Kingwood, Preston County—September 9th, 1921—Kingwood visited—the water supply for the town investigated. Inspected chlorinator, the operation of which is unsatisfactory, and made provision for continuous operation. Report on the new proposed mountain supply for the town discussed with water company officials.

Keyser, Mineral County—February 23rd, 1922—Inspection of new well drilled to supplement the present supply. Conference with Rotary Club delivered short talk on value of metering.

Kanawha City, Kanawha County—March 29th, 1922—Chlorinator inspected. Filter plant operation checked over with operator.

Keystone, Mineral County—August 2nd, 1921—Keystone visited and the water supply of the city inspected.

Kanawha City, Kanawha County—June 12th, 1922—Complete investigation of filtration plant. Advised company authorities how to get rid of troublesome algae growths in sedimentation basin.

Logan, Logan County—September 29th, 1921—Conference with City Health Officer, Mayor, Water Superintendent and interested citizens to discuss means for the raising of funds to construct a modern filtration plant. Detailed costs and estimates given. Bankers and others pledge support in floating bond issue. Plans drawn by engineer a few months later. Plant to be installed during winter of 1922. Inspected chlorinator at pump station.

Logan, Logan County—February 20th, 1922—Logan visited and chlorinator inspected.

Lochgelly, Fayette County—May 12th, 1922—Investigation of water supply sued by Virginian railroad for use in supplying drinking water on various coaches. Supply satisfactory.

Lewisburg, Greenbrier County—March 23rd, 1921—The chlorinator inspected and orthotoluidin testing set explained to the operator at the pump station.

Martinsburg, Berkeley County—July 19th, 1921—Inspection of water supply and chlorinator. Instructions in use of orthotoluidin set given to operator at this time. Inspection of municipal sewage disposal plant made.

Martinsburg, Berkeley County—February 24th, 1922—Inspection of swimming pool at Martinsburg and chlorinator for continuous disinfection of pool. Inspection of municipal sewage disposal plant. Sprinklers partially clogged. These were cleaned out and operated successfully before leaving.

Martinsburg, Berkeley County—February 24th, 1922—Inspection of water plant. Chlorinator not operating. Tank valve stopped up. Chlorinator put into operation.

Martinsburg, Berkeley County—July 9th, 1921—Installed new chlorinator at Rosemont for large concrete pool just completed for Rosemont

Park Company. Pool put in operation on Sunday with continuous circulation of chlorinated water. Inspection made of pool, toilet and shower facilities. Monthly reports of pool operation will be forwarded to this department.

Martinsburg, Berkeley County—July 10th, 1921—New chlorinator installed at Martinsburg pump station replacing the old method of disinfection by hypochlorite of lime. This latter method was uncertain and inaccurate.

Martinsburg, Berkeley County—July 1st, 1922—Complete investigation of new water supply to be used at Country Club. Since supply was obtained from surface stream chlorination was recommended.

Monclo, Logan County—July 21st, 1921—Small mining community using high iron and sulphur water. Plan of deferrizer forwarded to mine officials.

Monongah, Marion County—August 19th, 1921—Met Mr. Watson of Monongah Service Company. Visited pump station and inspected operation of chlorinator. Orthotoluidin test explained to operator at pump station.

Morgantown, Monogalia County—August 25th, 1921—Investigated Morgantown filter plant. Filter beds in poor shape. Plant needs re-vamping. Report made to that effect embodying many recommendations for alterations and additions. Several of these have since been adopted.

Morgantown, Monongalia County—March-June, 1922—Complete sanitary survey made of Morgantown and public health survey of Monongalia County. Extensive report of water supplies, sewerage conditions, garbage collection and housing made with detailed recommendations to city authorities and county court. Conference with city manager and city engineer. Talks made at luncheon clubs explaining objects of comprehensive survey. Newspaper articles contributed to local papers, thus helping in the campaign to pass favorably the proposed bond issue. Inspection made of some forty dairies supplying milk to the city of Morgantown. Detailed improvements were explained to each dairyman. These changes have been made in many instances. Analyses of the milk from these dairies was also made.

Mason City, Mason County—February 4th, 1922—Investigation of water supply used by Mason City and Pomeroy Company.

Mullens, Wyoming County—June 2nd, 1922—Investigation of well supply used by Virginian railroad for drinking water purposes on passenger coaches. Inspection of new pump station and wells of Mullens Water Company was made.

Mullens, Wyoming County—March 7th, 1922—Mullens visited and conference held with the city engineer regarding the proposed sewerage system for the town.

Madison, Boone County—October 24th, 1921—Madison visited and the newly completed sewerage system for the city inspected with the Mayor and engineer in charge. Well designed and constructed system.

Marlinton, Pocahontas County—August 30th, 1921—Marlinton visited and the proposed change in the water supply from drilled wells to an impounding dam discussed with the water commissioner.



**Moorefield, Hardy County**—September 2nd, 1921—Moorefield visited and the water supply for the town investigated. Meeting with several of the city councilmen to urge that chlorinator be installed to sterilize the water and safeguard supply. No action taken.

**Montgomery, Fayette County**—May 24th and 26th, 1922—Sanitary survey of the town made.

**Monaville, Logan County**—February 22nd, 1922—Monaville visited and the filter plant of the Island Creek Coal Company inspected. This small plant is well operated and is a model for many of the other coal camps in the state.

**Midelburg City, Logan County**—February 23rd, 1922—Sewerage project discussed with the city engineer. Recommended that the proposed extension of the outfall be made in order that the sewage would be emptied into the Guyan river below the Logan Water Works intake.

**Matewan, Mingo County**—May 31st, 1921—Matewan visited and emergency chlorinator installed to suppress outbreak of typhoid fever. Recommendations made for the carrying of a large sewer below the water intake and the installation of a city-owned chlorinator.

**New Martinsville, Wetzel County**—September 20th, 1921—Conference with city officials and other interested citizens was held relative to steps to be taken to increase present water supply. Present conditions were discussed and recommendations made to install an air lift well on shore to be connected into present pump equipment and to be installed with the object in view of adding further to this unit as other wells became necessary.

**New Martinsville, Wetzel County**—September 22nd, 1921—In company with City Health Officer, Dr. Fankhouser, inspection was made of old motion picture house now used as temporary school for children. Conditions not favorable to child's progress. Report with detailed recommendations made to school authorities. Inspection of city creamery made at this time.

**New Martinsville, Wetzel County**—February 2nd, 1922—Survey of a portion of New Martinsville was made preparatory to final authorization of proposed sewerage system for that section. Inspection of water plant made. City proceeding to install test well in order to augment present supply.

**Nitro, Putnam County**—January 24th, 1922—Inspection made of filter plant located at former government site. Plant operation satisfactory.

**Oak Hill, Fayette County**—May 12th, 1922—Conference with Chamber of Commerce relative to water supply system for Oak Hill. Plans and prices prepared. Chamber voted for issue of \$50,000 to include construction of wells, reservoirs and distribution system.

**Oak Hill, Fayette County**—March 20th, 1922—Meeting with the Secretary of the Chamber of Commerce. The proposed new water supply for the town discussed.

**Omar, Logan County**—February 21st, 1922—Omar visited and iron removal and water softening plant which supplies water to the coal company inspected. Operation inefficient.

**Piedmont, Mineral County**—July 13th, 1922—Conference with Mayor Drane looking towards the installation of a modern mechanical filtration plant. Present supply is unsatisfactory in volume and ineffectively chlorinated.

**Piedmont, Mineral County**—July 13th, 1921—Conference with Mayor concerning improvements to new water supply. Inspection of disinfection plant of public supply as carried on at the West Virginia Pulp & Paper Company. Plant of Luke, Maryland. The greater portion of Piedmont water is obtained from the pulp company and is chlorinated at their plant. Improvements in the way of booster pump are planned for Piedmont.

**Paden City, Wetzel County**—February 3rd, 1922—Conference with Mayor Kiefer relative to proposed new water supply system. Contract let for \$30,000 system to Des Moines Steel Company.

**Pennsboro, Ritchie County**—December 9th, 1921—Conference with Mayor Zinn relative to flotation of bond issue to be used in construction of a modern sewerage system. Estimate of cost of sewers and probable amount of bond issue given to authorities.

**Pennsboro, Ritchie County**—November 4th, 1921—Pennsboro visited. Mayor interviewed to see what plans were being made to give the city much needed sewerage system and to urge haste in bringing up bond issue for this purpose.

**Parkersburg, Wood County**—November 2nd, 1921—Parkersburg visited. Dr. R. G. Lang, City Chemist, tests for free chlorine were made in various parts of the city, complaints from chlorine tastes being frequent. No free chlorine was found and the dosage at the pump station was increased as it was felt the water was not being properly treated.

**Parkersburg, Wood County**—November 2nd, 1921—Parkersburg, visited and typhoid data in the city covering the spring and summer months collected.

**Parkersburg, Wood County**—May 9th, 1922—Parkersburg visited and the chlorinator inspected. Turbidity standards for the city chemist prepared.

**Parsons, Tucker County**—September 10th, 1921—Parsons visited and the chlorinator inspected. Operation satisfactory. Extra parts recommended.

**Philippi, Barbour County**—February 21, 1922—Inspection of proposed chlorinator operation ascertained. Explained the orthotoluidin testing set for the control of the chlorinator to the superintendent.

**Pratt, Kanawha County**—August 26th, 1921—Inspection of the chlorinator made and orthotoluidin testing set explained. Chlorinator being conscientiously operated.

**Petersburg, Grant County**—September 3rd, 1921—Inspection of chlorinator and explanation of use of the orthotoluidin testing kit to the operator. The proposed installation of a sewerage system discussed with mayor.

**Philippi, Tucker County**—February 21st, 1922—Inspection of proposed new water supply source. Contemplated using small stream three miles from town with use of an impounding reservoir. Supply satisfactory but chlorinator will be needed.

**Princeton, Mercer County**—April 26th, 1922—Brief sanitary survey made, with special reference to garbage disposal.

**Princeton, Mercer County**—October 6th, 1921—Princeton visited to investigate the water supply for the city. Three new wells had been completed assuring an adequate supply of water for the city.

**Rowlesburg, Preston County**—July 7th, 1921—Inspection of chlorination. Chlorinator not working at time of arrival. Put into service after a few repairs and arrangements made to send to this department weekly cards detailing the operation of the plant. Small typhoid fever outbreak occasioned by the use of this untreated water was investigated. Spare parts have been ordered by council for the chlorinator.

**Rowlesburg, Preston County**—September 7th, 1921—Rowlesburg visited and the chlorinator inspected. The orthotoluidin testing kit explained.

**Riverside, Monongalia County**—June 14th, 1922—Investigation of existing and proposed sewerage system for small town of Riverside, a few miles west of Morgantown preparatory to issuance of final authorization to install proposed system. Conference with mayor and interested citizens.

**Ronceverte, Greenbrier County**—March 21st, 1922—Ronceverte visited and the chlorinator inspected. Orthotoluidin testing set explained to the operator.

**Romney, Hampshire County**—September 3rd, 1921—Water supply of the town investigated in company with the Mayor.

**Rawl, Mingo County**—March, 1922—Inspection of a pressure filter water plant supplying water to the inhabitants of the mining camp. Previous to the visit there had been several cases of typhoid fever and one death due probably to the water. Plant poorly operated. Recommendations made for bettering the operation.

**Sabraton, Monongalia County**—May 15th, 1922—Sanitary survey made of this industrial town including complete data on garbage and sewerage disposal systems, water and milk supplies. Detailed report and recommendations for improvement in these various lines submitted to the Mayor of Sabraton. Analysis of milk supplied to Sabraton made by University in connection with survey. Installation of a portion of proposed sewerage system for western part of town inspected.

**Scotts Run, Monongalia County**—June 15th, 1922—Detailed sanitary house to house survey of some twelve coal mining colonies made. Comprehensive report of this whole district forwarded to each company advocating a single sanitary inspector whose duty it will be to satisfactorily establish decent sanitary methods and conditions in each of the camps.

**Shinnston, Harrison County**—January 14th, 1922—Inspection of filter plant and chlorinator. Operation of chemical tests explained to operator. Plant operating satisfactorily.

**Shepherdstown, Jefferson County**—February 25th, 1922—Investigation of water and sewerage system. Plans obtained of both water and sewerage lines. Inspection of filter plant made. Filters need overhauling and replacement with new type of filter.

**St. Albans, Kanawha County**—March 4th, 1922—St. Albans visited and the operation of the new filter plant and keeping of daily records explained. The chlorinator was put upon a continuous operation basis.

**St. Albans, Kanawha County**—May 5th, 1922—Inspection of new filter plant. Conference with superintendent regarding training of filter operators so that plant can be properly operated at all times. Tentative arrangements entered into.

**Sutton, Braxton County**—September, 1921—Sutton visited and water supply for the town carefully investigated. The untreated Elk River water is pumped directly to the water consumers. Meeting with the secretary of the water company and recommendation made that a chlorinator be installed. No action taken.

**Spencer, Roane County**—May 8th, 1922—Spencer visited and the chlorinator inspected. Additional water supply equipment being developed and aerators installed below impounding reservoir.

**Salem, Harrison County**—May 10th, 1922—Water supply for the city investigated in company with water works superintendent.

**Terra Alta, Preston County**—August 14th, 1921—Inspected all three old pump stations and new pump station now being built. Several new springs have been constructed. Recommendations for the covering of these springs were made in order to keep out all contamination. Previous recommendations pertaining to older spring houses have been carried out by the company officials.

**Thomas, Tucker County**—February 22nd, 1922—Conference with Mayor Hinebaugh concerning proposed \$50,000 bond issue for construction of filter plant. Chlorinator plant visited and found not to be operating. Operator found and plant repaired and started.

**Thomas, Tucker County**—July 15th, 1921—Thomas visited to inspect a home-made chlorinator, the operation of which has been unsatisfactory.

**Vulcan Mines, Mingo County**—April 12th, 1922—Vulcan Mines, a mining town, visited. Operation of the chlorinator and the pressure filter inspected with the superintendent of the coal company.

**Vivian, McDowell County**—August 3rd, 1921—Vivian visited and the water supply for the town inspected. Water supply is obtained from a drilled well.

**Wellsburg, Brooke County**—September 16th, 1921—An inspection of progress made on the installation of the new air-lift system was made. Salt has been discovered in both wells, one well having as high as 1500 p. m. of salt. This rendered the water unfit for use. A meeting was arranged for the consideration of a new supply. A recommendation that mechanical filtration be the next step was made and an explanation of this process and the cost of such a system was given. The opinion of the members was that competent engineers should be retained and plans submitted by them.

**Wellsburg, Brooke County**—February 2nd, 1922—Investigation of water supply used by Brilliant & Bridge Company for packet boats. Drinking water supply to be abandoned.

**Wellsburg, Brooke County**—July 19th, 1922—Wellsburg visited. A proposed filter plant discussed with the water commissioner of the city.

**West Union, Doddridge County**—July 15th, 1921—Met Mayor Keiger and made inspection of new well being drilled to augment water supply and inspected present pump station. Plans for treatment of water by

hypochlorite of lime were given the Mayor and arrangements made to have this installed immediately. Report cards will be sent by this department, keeping us informed of the operation and dosage of the hypo plant. Inspection made of several stables which have occasioned objections from many people. A model stable ordinance was forwarded for adoption by council.

West Union, Doddridge County—November 3rd, 1921—West Union visited to ascertain how the new water supply was developing. Also temporary hypochlorite treatment plant inspected. Operator using photographer's hypo instead of hypochlorite of lime. Mistake rectified.

Wheeling, Ohio County—September 21st, 1921—Wheeling piggery inspected due to complaints lodged by parties located near said piggery. Inspection of Bronze Casting Company's plant made. Conference with city officials relative to present attitude of city towards possible flotation of bond issue in near future for construction of mechanical filtration system.

Wheeling, Ohio County—February 2nd, 1922—Inspection of Elm Grove water plant. Explained operation of chlorinator to operator at Wheeling Y. M. C. A. swimming pool. Conference with city manager concerning proposed bond issue for new filtration plant.

Wheeling, Ohio County—February 21st, 1922—Conference with Sanitary Engineer Green of U. S. Public Health Service concerning certification of water supplies for vessels on Ohio and Kanawha Rivers.

Wheeling, Ohio County—June 12th-20th, 1922—Wheeling visited and tuberculosis spot maps prepared for the tuberculosis survey which was being conducted in the city. Also brief survey of water, sewerage and garbage situation made.

Wheeling, Ohio County—March 27th, 1922—Final arrangements made with Mayor and city authorities and consulting engineer employed by the city to assist in the campaign for a two million dollar bond issue. Publicity material furnished. This consisted of written articles for newspapers, moving picture slides and exhibits.

Westover, Monongalia County—June 1st, 1922—Conference with Mayor of Westover and investigation of layout of proposed sewer installations forming greater part of the sewerage system of the town. Plans approved and work started a few days later.

Weston, Lewis County—October 8th, 1922—Three-day visit to Weston to begin bacteriological tests at newly equipped laboratory of the Weston Water & Electric Light Company. This laboratory is the fruit of the constant labor of this division to bring before the company the necessity of daily tests of the water delivered. Weston will now know each day the quality of its water.

Weston, Lewis County—October 11th, 1922—Inspected sewage disposal plant at Weston State Hospital. Plant not operated well. Recommended cleaning of baffle walls to prevent gassing in scum chamber. Syphon to trickling filters not working in afternoon. Leak discovered in pipe line to disposal plant.

Welch McDowell County—August, 1921—Welch visited and the water supply for the town inspected. A new well had been drilled, new pumping

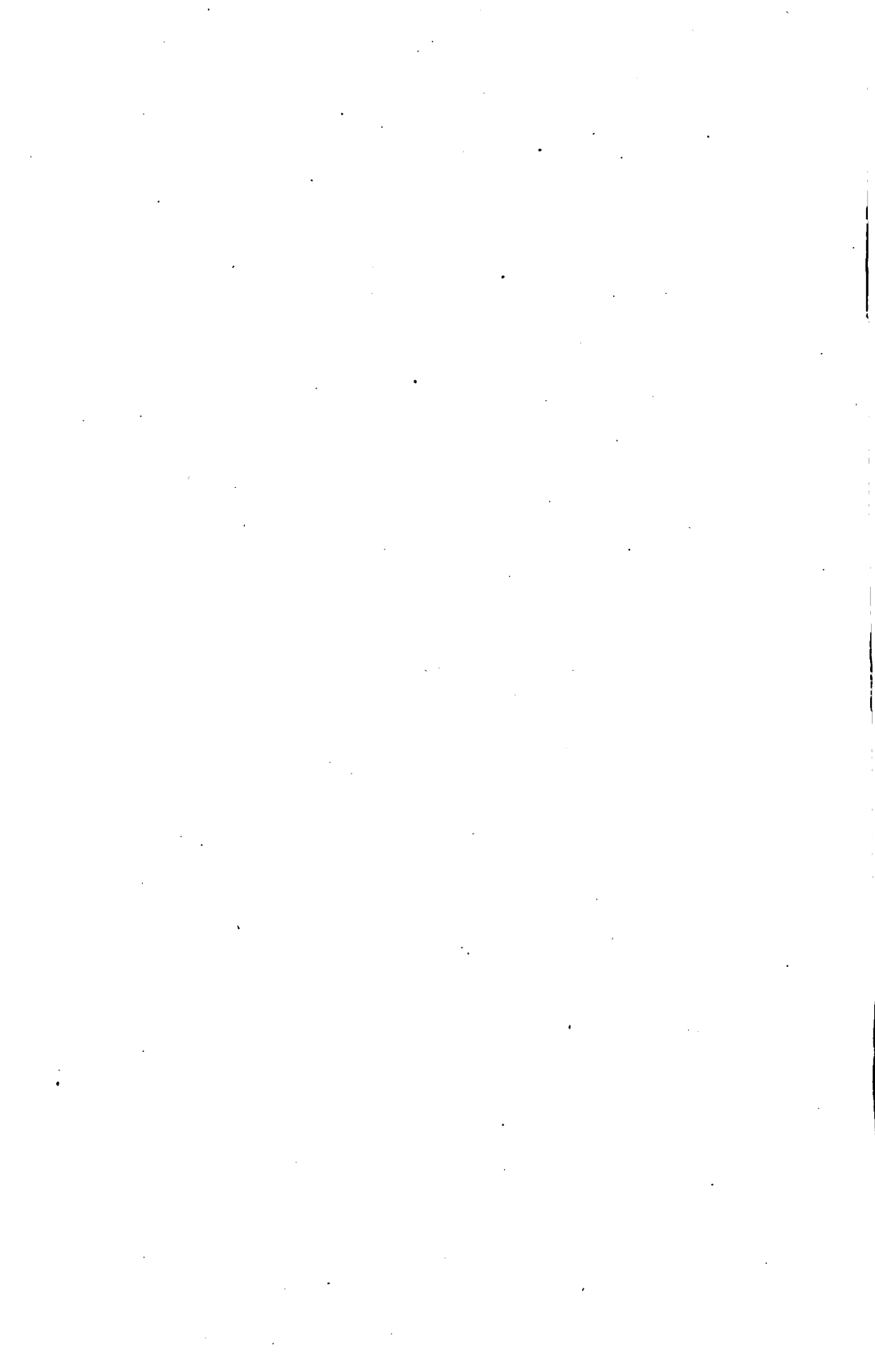
machinery had been installed and a chlorinator is held in reserve to assure a safe water supply for the community.

**Williamson; Mingo County**—August 1st, 1921—Williamson visited and the filter plant inspected. The operation and design of plant is bad. Consulting engineers had been retained to advise about improvements to the filter plant. Later an additional visit was made and tests for better operation of the plant were explained.











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